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# Additions and Corrections to the Rust Fungus Flora of Minnesota

JOHN W. MCCAIN

**ABSTRACT**—Ten taxa of rust fungi (*Coleosporium campanulae*, *Puccinia amphigena*, *P. caulicola*, *P. longipes* var. *brevipes*, *P. mcclatchieana*, *P. magnusiana*, *P. punctata* var. *troglodytes*, *Tranzschelia arthurii*, *Uromyces dictyosperma*, and *U. plumbarius*) are reported for the first time from Minnesota. Seven other rust species (*Puccinia adoxae*, *P. distichlidis*, *P. interventiens*, *P. pygmaea*, *P. typhae*, *Uromyces andropogonis*, and *U. geranii*) should be removed from the state flora list. *Puccinia typhae* also is excluded from the U.S. rust flora list. New Minnesota host plants are reported for fifteen rust pathogens. One host species is deleted for *P. polygoni-amphibii*. Intrastate 200-mile range extensions are reported for four rust fungi.

## Introduction

The rust fungi (order *Uredinales*) that cause diseases on economically important plants are well-documented. The rust species on non-crop plants have received less attention. Only two preliminary (1,2) lists of Minnesota rust fungi and one of plant diseases (3) are available. At least 40 rust species are reported from Wisconsin that have not yet been found in Minnesota.

The objectives of this project were to update and extend the list of Minnesota rust fungi and to bring the nomenclature up to date for Minnesota rust specimens in the Plant Pathology Herbarium (MPPD) of the University of Minnesota (herbarium designations are from (4)). Field collecting of new specimens was supplemented by searching the University of Minnesota Botany Herbarium (MIN) for previously unnoticed rust infections on leaves or other parts of host plant specimens already in the herbarium (5). These rusts, gathered incidentally as the host plants were being preserved, afforded a chance for (a) winter collecting and (b) collecting from nature preserves without taking new specimens from the preserves. To date, 517 such "hitchhiker" rust collections have been made from the pre-existing host material in MIN.

Thirty-one new records or range extensions for Minnesota rust fungi were identified over the past three years. In addition, thirteen corrections to previous reports are suggested. The Minnesota list of rust fungi now stands at 23 genera, with 183 species and six additional varieties, for a total of 189 state taxa. The ease with which these new records were obtained indicates that basic floristic surveys still need to be done in this important group of plant pathogenic fungi.

The new or corrected records are listed alphabetically by the name of the fungus. Except as noted, nomenclature of the fungi follows Farr *et al.* (6), whom I advised on rust species names. The life cycle stages observed for each pathogen are abbreviated 0, indicating pycnia (which produce spermatia); I, aecia (aeciospores are multiple copies of zygotes); II, uredinia (urediniospores are vegetative, clonal spores); and III, telia (meiosis occurs in teliospores). Spore morphology varies between genera and some species omit one or more of the stages from their life cycles. Nomenclature

of the host plants follows Ownbey and Morley (7). The nearest town or major geographic feature is listed for each specimen, followed by the year of collection, collector's name and log number (underlined), and herbarium accession number. Voucher specimens for new collections have been deposited in MPPD or the Arthur Herbarium (PUR) of Purdue University.

## List of Additions and Corrections

### 1. *COLEOSPORIUM CAMPANULAE* Lev. ex Kickx

Specimen examined: II on *Campanula rapunculoides* L., MN: Ramsey Co., St. Paul, 1986, McCain 86007, MPPD-40067.

This new rust species for Minnesota has been reported previously from Wisconsin on this and two other species of bellflower (6). Although the fungus has been combined, on morphological grounds, under *Coleosporium tussilaginis* (Pers.) Lev. in C. d'Orb. (6), it is most probably biologically distinct.

### 2. *PHRAGMIDIUM POTENTILLAE* (Pers.:Pers.) P. Karst.

Specimen examined: II on *Potentilla argentea* L., MN: Ramsey Co., Roseville, 1987, Groth, specimen in PUR.

This is a new Minnesota host for this rust fungus, which was previously known in this state on three other cinquefoil species (3).

### 3. *PUCCINIA ACETOSAE* Koern.

Specimens examined: II on *Rumex acetosella* L., MN: Cook Co., Grand Marais, 1934, Dosdall, MPPD-4017.

Preston & Dosdall (3) listed the host as *R. orbiculatus* Gray, undoubtedly as an error in copying during the compilation process. The latter species of dock hosts *P. ornata* Arth. & Holw. in Arth. *et al.* in Minnesota (1).

### 4. *PUCCINIA ADOXAE* R. Hedw. ex DC.

Specimens examined: III on *Adoxa moschatellina* L., CANADA: Ontario, Thunder Bay Distr., 1987, Garton 23710, MIN-799963 ex MIN-796038 ;

- *P. argentata* (C. F. Schultz) Wint. OI on *A. moschatellina*, MN: Fillmore Co., Wykoff, 1982, Smith 6014, MIN-757981; Goodhue Co., Welch, 1928, Broadfoot, MPPD-3622, also 1920, Melander, MPPD-3385; St. Louis Co., Duluth, 1938,

Lakela, MIN-345884; Lake Superior N of Duluth, 1949, Lakela, MIN-405369; no locality but probably Minneapolis, Luggar, MIN-08476;

- *P. argentata*, IA: Decorah, 1885, Holway, as *P. adoxae*, MIN-315918. This microcyclic rust species was listed previously in Minnesota (6) from Goodhue (3) and Winona counties (2). However, reexamination of the Minnesota specimens of "*P. adoxae*" (MIN-08476, MPPD- 3385, -3622; no Winona Co. specimen found) indicates that they actually are the aecial state of *P. argentata*. The misidentification may have resulted from comparison with early specimens (Iowa specimen noted above), that were collected before the life cycle of *P. argentata* was elucidated, and for which, therefore, the name *P. adoxae* had been the best available.

Thus, no currently valid records support the presence of *P. adoxae* in Minnesota. However, a specimen of *P. adoxae* was found from a nearby part of Ontario, the first record for that province (J. A. Parmelee, pers. comm.). This suggests that a valid specimen of this rust fungus still could be found in Minnesota.

#### 5. *Puccinia amphigena* Dietel.

Specimens examined: II,III on *Calamovilfa longifolia* (Hook.) Scribn., MN: Anoka Co., Andover, 1987, McCain 87007, MPPD-40076, duplicate in PUR; Dakota Co., Hastings, 1979, Smith 1344, MIN-711577; Scott Co., Jordan, 1985, Morley 1658, MIN-776316; Sherburne Co., St. Cloud, 1944, J.W. Moore 16902 & Hall, MIN-449233.

This new rust fungus species for Minnesota was previously known from North and South Dakota, Wisconsin, and Manitoba (6,8,9).

#### 6. *Puccinia argentiata* (C. F. Schultz) Wint.

Specimens examined: OI - see under *P. adoxae*,  
- II,III on *Impatiens pallida* Nutt., MN: Fillmore County, Spring Valley Creek, 1968, Morley 1228, MIN-607352; Nicollet Co., Traverse des Sioux Park, 1947, J. W. Moore 19769 & Huff, MIN-488590.

This is a new telial host species for this rust fungus in Minnesota. Previously, *P. argentata* was reported on *I. capensis* Meerb. from Ramsey County (3). New specimens of aecia on *Adoxa* from St. Louis County represent a 150-mile range increase within the state.

#### 7. *Puccinia atropusca* (W. R. Dudley & C. H. Thomps.) Holw.

Specimen examined: OI on *Artemisia ludoviciana* Nutt., MN: Hubbard Co., Lake George, 1919, J. J. Christensen, MPPD-3530.

This is a new host species for this rust fungus in Minnesota. The specimen was reported in error by Preston and Dosdall (3) as *P. absinthii* (Hedw. f.) DC. (now known as *P. tanacetii* DC. var. *dracunculina* (Fahrendorff) Cummins). The cupulate (accioid) aecia on the MPPD specimen readily distinguish the fungus from the uredinoid aecia expected for *P. tanacetii* var. *dracunculina*. The telia are on *Carex heliophila* Mackenz.

#### 8. *Puccinia calcitrapae* DC. var. *BARDANAE* (Wallr.) Cummins

Specimens examined: III on *Arctium minus* (Hill) Bernh., MN: Hennepin Co., Ft. Snelling, 1922, Dosdall, MPPD-3555, -3573; II,III, Minneapolis, 1980, McCain 80028; Ramsey Co., St. Paul, 1987, McCain 87003, MPPD-40073;

- III of *P. helianthi* Schwein. on *Helianthus annuus* L., MN: Hennepin Co., Minnehaha Park, 1937, Dosdall, MPPD-4101 (originally identified as burdock rust).

This is a new host species for this rust fungus in Minnesota, based on correction of host identification. The rust was reported from these counties on *A. lappa* L. (3), but in fact two of the MPPD voucher specimens contain *A. minus* inflorescences; the third specimen is a misidentified sunflower leaf.

#### 9. *Puccinia caulicola* Tracy & Gall.

Specimens examined: II,III on *Salvia reflexa* Hornem., MN: Lincoln Co., Lake Benton, 1954, J.W. Moore 22268 & G.B. Ownbey, MIN-799714 ex MIN-550137; Pipestone Co., Pipestone Nat. Monument, 1954, Stevens, MIN-799966 ex MIN-501649; II, Wright Co., Annandale, 1940, E. & H. Alspa, MIN-359267; Yellow Medicine Co., Lake Bailey, 1938, J.W. & M.F. Moore 10524, MIN-799713 ex MIN-367236.

This new rust species for Minnesota was reported previously on this host from Iowa, South Dakota, and Wisconsin (6).

#### 10. *Puccinia dayi* G. W. Clint. in Peck

Specimens examined: OI of undet. rust fungus on *Lysimachia ciliata* L., MN: Jackson Co., Heron Lake, 1902, Skinner 293, MIN-799948 ex MIN-170854; Swift Co., Benson, 1973, Scanlan 068, MIN-799938 ex MIN-657176; Wright Co., Buffalo, 1981, Smith 4546, MIN-799920 ex MIN-745474;

- III of *P. dayi*, St. Louis Co., Meadowlands, 1922, Gilbert, MPPD-3554, -3589.

Preston and Dosdall (3) also listed *P. dayi* from Pine County, but a voucher specimen cannot be found. Many such specimens are no longer available in MPPD because of poor storage prior to 1975. Freeman (2) listed *Aecidium lysimachiae* (Schlechtend.) Wallr. non Schwein. from Pine County, and this is the likely basis for the later listing. However, aecia on loosestrife cannot be of the microcyclic *P. dayi*, so Pine County should be deleted from the record for this rust species.

Three rust fungi with aecia on loosestrife are known to occur nearby: *P. distichlidis* in South Dakota (8, see below) and *Uromyces acuminatus* Arth. in Minnesota, both with telia on *Spartina* spp. (cordgrass), and *P. limosae* P. Magn. in Wisconsin and Ontario, with telia on *Carex* spp. (6,8). *Lysimachia* has not been listed as a Minnesota host under any of these taxa. Three *L. ciliata* collections in MIN included rust aecia. None of the aeciospores possessed germ pore plugs ("refractive granules") that would have identified them as *P. limosae* (10). The remaining two rust fungi cannot be distinguished by their aecial states.

#### 11. *Puccinia distichlidis* Ellis & Everh.

Specimens examined: II,III on "*Spartina michauxiana*," MN: Ramsey Co., 1922, Gilbert, MPPD-3504;

- II,III of *P. andropogonis* Schwein. on *Andropogon gerardii* Vitman, MN: Chisago Co., near Rush City, 1980, Converse 588, MIN-799919 ex MIN-730292; Winona Co., Lock & Dam #5, 1980, G. B. Ownbey 6669, MIN-799951 ex MIN-743843.

The MPPD specimen, which is the voucher for the only Minnesota report of *P. distichlidis* (3), was misidentified. The spores did not match any known rust fungus on *Spartina* but, rather, resembled *P. andropogonis*. Comparison with specimens in MIN confirmed that the host of MPPD-3504 was *A. gerardii*. Although *P. distichlidis* cannot at this time be proven for Minnesota, its occurrence in Iowa, North and South Dakota, and Manitoba on *S. gracilis* Trin. and *S. pectinata* Link (6,8) suggests it may yet be found in this state.

#### 12. *Puccinia helianthi* Schwein.

Specimen examined: II,III on *Helianthus petiolaris* Nutt., MN: Isanti Co., Cedar Creek Nat. Hist. Area, 1957, J.W. & M.F.

Moore 23530, MIN-558366.

This is a new host species in Minnesota for this rust fungus which has been previously reported on several other sunflower species in this state (3).

13. *Puccinia hieracii* (Roehling) H. Mart. var. *hieracii*

Specimen examined: II on *Taraxacum erythrospermum* Andr., MN: Dakota Co., Hastings, 1943, J.W. Moore 15777, MIN-799921 ex MIN-383781.

This is a new host for this rust species in Minnesota. Previous reports of *P. hieracii* on *T. erythrospermum* include North Dakota (8), Wisconsin (6), and Ontario (9).

14. *Puccinia interveniens* Bethel in Blasdale

This rust fungus was reported from Ramsey Co. on *Sphaeralcea coccinea* (Nutt.) Rydb. (3), but no voucher specimen can be found. The usual range of this rust fungus extends as far east in the United States as western Nebraska and South Dakota (6). Because the record cannot be checked, this rust species should not be listed for Minnesota.

15. *Puccinia longipes* Lagerh. var. *brevipes* (Dietel) Z. Urban

Specimens examined: II on *Vernonia fasciculata* Michx. ssp. *fasciculata*, MN: Houston Co., Jefferson, 1899, Wheeler 408, MIN-799908 ex MIN-217059; III, Pipestone Co., Pipestone Nat. Monument, 1954, J.W. Moore 22422 & G.B. Ownbey, MIN-799914 ex MIN-553747; and St. Louis Co., Floodwood, 1953, Lakela 16858, MIN-799712 ex MIN-493028.

This new rust taxon for Minnesota was previously reported on this host species from Iowa, North and South Dakota (6), and Wisconsin (2).

16. *Puccinia mcclatchieana* Dietel & Holw. in Dietel

Specimen examined: II,III on *Scirpus microcarpus* Presl, MN: Hubbard Co., PUR-88931, ex WYO.

This new rust fungus species for Minnesota is known from scattered U.S. locations, including North Dakota (8) and Wisconsin (6).

17. *Puccinia magnusiana* Koern.

Specimen examined: II,III on *Phragmites australis* (Cav.) Steud. ssp. *australis*, MN: Hennepin Co., 1923, Henry, MPPD-3705;

- *Puccinia phragmitis* (Schumach.) Koern. II on *Phragmites australis* ssp. *australis*, MN: Anoka Co., Carlos Avery Refuge, 1989, McCain 89022, MPPD-40097; and Carver Co., Chaska, 1935, Grow, MPPD-4031.

This is the first report of this rust species from Minnesota, based on corrected identification of a specimen previously labeled *P. phragmitis* (Schumach.) Koern. The paraphysate uredinia with thin-walled, ellipsoid spores with scattered germ pores do not match the thick-walled, obovoid urediniospores with equatorial germ pores found in the *P. phragmitis* specimens. Previous reports of *P. magnusiana* from every surrounding state and province (6,8,9) suggested this species might be expected to occur in Minnesota. Aecia on *Anemone* spp. are probable in this state also.

18. *Puccinia mariae-wilsoniae* G.W. Clint. in Peck var. *mariae-wilsoniae*

Specimens examined: OI on *Claytonia caroliniana* Michx., MN: St. Louis Co., Duluth, 1938, Lakela 2371, MIN-354033; III, Cook Co., Oberg Mtn., 1982, Coffin & Engstrom 82-49, MIN-777516.

These specimens from the Arrowhead region of Minnesota represent a range extension of more than 200 miles from the previous record in Goodhue Co (3). This rust species also

occurs on *C. virginica* L. from Hennepin to Houston counties.

19. *Puccinia pimpinellae* (F. Strauss) Mart.

Specimen examined: II,III on *Osmorhiza longistylis* (Torr.) DC., MN: Big Stone Co., Ortonville, 1973, Scanlan 132, MIN-657092; Kittson Co., Lake Bronson, Moore 24837 & McAndrews, MIN-574537.

This is an intrastate range extension of 200 miles from the only previous county record (Aitkin Co. - 3). The fungus also occurs on *O. claytonii* (Michx.) Clarke from Houston (3) to Morrison counties (MIN-700872).

20. *Puccinia polygoni-amphibii* Pers.:Pers.

a. Specimen examined: II,III on *Polygonum coccineum* Muhl. forma *natans* (Wiegand) Stanford, MN: St. Louis Co.: Pelican Lake, 1935, Moyle 2448, MIN-337942.

This is a new host for Minnesota of a widespread, common rust fungus previously known in this state on seven other *Polygonum taxa* (3).

b. Specimen examined: II,III on *P. persicaria* L., MN: Renville Co., Bird Island, 1986, McCain 86017, MPPD-40070.

This is another new host species for Minnesota.

c. Specimen examined: II,III on *P. arenastrum* Jord. ex Boreau (*P. aviculare* auct. non L.), MN: Hennepin Co., Groveland, 1917, Jensen, MPPD-2367.

Although cited under this rust species (3), the voucher specimen actually is *Uromyces polygoni-aviculariae* (Pers.:Pers.) P. Karst., which has been reported previously from this state. Thus, this species of knotweed should not be listed as a host of the *Puccinia* rust.

21. *Puccinia punctata* Link var. *trogloodytes* (Lindr.) Arth.

Specimens examined: II,III on *Galium triflorum* Michx., MN: Blue Earth Co., Mankato, 1958, J.W. Moore 24413, MIN-574810; Fillmore Co., Forestville St. Park, 1982, Smith 7484, MIN-758227; and St. Louis Co., Iron Lake, 1951, Lakela 12530, MIN-442794.

This is a new rust fungus taxon for this state. *Puccinia punctata* var. *punctata* has been reported on three other species of bedstraw in Minnesota (3).

22. *Puccinia pygmaea* Erikss. non Diet. var. *pygmaea*

Specimen examined: on *Oryzopsis asperifolia* Michx., MN: Clearwater Co., Itasca St. Park, 1936, Rovang, MPPD-4182.

This rust species should be excluded from the Minnesota list, pending further collecting. There is no rust on the MPPD specimen, the voucher for the only report of any rust on *Oryzopsis* from Minnesota (3). The leaf spots present resemble those of tarspot, caused by *Phyllachora oryzopsidis* (Rehm) Theiss. & Syd., an ascomycete fungus which also occurs in Clearwater Co. (3).

Although Farr *et al.* (6) list *Oryzopsis* as a host of *P. pygmaea*, the rust on this grass was segregated as *P. brachypodii-phoenicoidis* Guyot & Malencon var. *davitsii* Cumm. & H. C. Greene (11). As the type locality of var. *davitsii* is Ashland, Wisconsin, it is possible that *Oryzopsis* rust could yet be found in Minnesota. In addition, true *P. pygmaea* remains a possibility for occurring in this state on several grass hosts (11).

23. *Puccinia saxifragae* Schlechtend. var. *curtipes* (Howe) Dietel

Specimens examined: III on *Saxifraga pensylvanica* L., MN: Hennepin Co., Purgatory Swamp, 1922, Gilbert, MPPD-3508; Ramsey Co., St. Paul, 1920, J.J. Christensen, MPPD-3398;

- on *S. virginensis* Michx., MN: St. Louis Co., Duluth, 1969, D.A. Ownbey 181, MIN-799956 ex MIN-671218.

*Saxifraga virginensis* is a new host for Minnesota. According to the specimen label, the rosettes were found in Duluth and transplanted to greenhouses in St. Paul. The extensive sori suggest the rust was already present when the plants were moved.

This rust species was not listed from Minnesota by Farr *et al.* (6), who omitted the revision of Saxifragaceae rusts by Savile (12). However, rusts on *Heuchera*, *Mitella*, and *Saxifraga* were all listed from Minnesota by Preston and Dosdall (3) but under the name *P. heucherarum* (Schwein.) Dietel *sans var.* Following Savile (12), the specimens in MIN and MPPD were sorted out as follows:

a.) *P. heucherarum* var. *minor* Savile III on *Mitella diphylla* L., MN: Wadena Co., Menahga, 1941, J.W. Moore 14843 & Jacobs, MIN-799923 ex MIN-373254;

- and III on *M. nuda* L., MN: Cass Co., Boy River, 1972, G.B. Ownbey 4569, MIN-799958 ex MIN-627724;

b.) *P. saxifragae* var. *heucherarum* Savile III on *Heuchera richardsonii* R. Br., MN: Big Stone Co., Ortonville, 1931, J.W. Moore, MIN-799964 ex MIN-277515; Isanti Co., Cedar Creek Nat. Hist. Area, 1981, J.W. Moore 25616, MIN-799926 ex MIN-572427; Ramsey Co., St. Paul, 1924, Henry, MPPD-3730; Renville Co., Morton, 1979, Wheeler 4088, MIN-709098;

c.) *P. heucherarum* var. *heucherarum* occurs on *Tiarella cordifolia* L. from Wisconsin and Michigan (Isle Royale-6), plus adjacent Ontario (9).

#### 24. *Puccinia sparganoides* Ellis & Barth.

Specimen examined: II, III on *Spartina gracilis* Trin., MN: Polk Co., near Mentor, 1986, Dana 86095, MIN-799912 ex MIN-792919. This is a new host in Minnesota of a widespread rust fungus which also has telia on *S. pectinata* Link and aecia on ash leaves (*Fraxinus* spp. - 3).

#### 25. *Puccinia tanacetii* DC. var. *dracunculina* (Fahrenndorff) Cummins

Specimens examined: II, III on *Artemisia ludoviciana* Nutt., MN: Big Stone Co., Ortonville, 1950, J.W. Moore 20837, MIN-799930 ex MIN-507467; Houston Co., Spring Grove Village, 1933, Rosendahl 6506, MIN-358278; Kittson Co., Hallock, 1959, J.W. Moore 24805 & McAndrews, MIN-799929 ex MIN-574768; and Wabasha Co., Weaver Dunes, 1982, Galatowitsch 728, MIN-799962 ex MIN-747165.

The previous report of this rust on this species of wild wormwood in Minnesota (3) was based on a specimen that actually was *P. atrofusca*. These four specimens re-establish this record. Cummins (13) listed *A. ludoviciana* only as a host of *P. ludoviciana* Fahrenndorff, but the Minnesota spores are not a clear match for that rust species. No striate teliospores were seen, and the urediniospores were more ellipsoid than obovoid, with smooth (nonverrucose) surfaces on the flattened sides.

#### 26. *Puccinia typhae* Kalchbr. (Bot. Zeit., p. 175, 1864).

Specimen examined: on *Typha latifolia* L., MN: Isanti Co., Isanti, 1919, J.J. Christensen, MPPD-3552.

This rust fungus has been reported only once from North America, and that was the Minnesota citation from two localities by Preston & Dosdall (3). The Isanti Co. voucher specimen in MPPD was re-examined and found to contain cattail leaves with brown splotches on the blades. No rust structures or spores could be found in these spots. No Ramsey County voucher specimen was found for re-verification.

Rust is not probable on cattail, however. The species *P. typhae* was named based on a misidentified host plant. The host actually was *Scirpus lacustris* L., and the rust fungus was *P. scirpi* DC. (14). Thus, *P. typhae* should be excluded not only from the Minnesota rust list but also from the North American rust flora. At my request, this species was omitted by Farr *et al.* (6).

#### 27. *Puccinia vilfae* Arth. & Holw. in Arth. var. *vilfae*

Specimens examined: III (with scant II) on *Sporobolus asper* (Michx.) Kunth., MN: Blue Earth Co., Cambria, 1958, J.W. Moore 24395, MI N-799933 ex MIN-574835; Traverse Co., "roadside," 1954, Allison, MIN-799939 ex MIN-504072.

This is a new host and the first report of telia in Minnesota for this rust fungus, which was previously reported in Brown Co., MN, as aecia on *Verbena stricta* Vent. (3).

#### 28. *Tranzschelia arthurii* Tranzschel & Litv.

Specimens examined: II, III on *Prunus serotina* Ehrh., MN: Benton Co., Foley, 1946, J.W. Moore 18879 & Huff, MIN-448332; no locality or date given, Lugger, MPPD-1180; III, Becker Co., Ponsford, 1980, Scientific & Natural Areas Inventory Project, MIN-734276.

This is a new host species for this rust fungus in Minnesota. A segregate of *T. pruni-spinosae* (Pers.) Pers. Dietel, *T. arthurii* has aecia on *Hepatica acutiloba* DC. in southeastern Minnesota (3).

#### 29. *Uromyces andropogonis* Tracy

Specimen examined: OI of *Puccinia violae* (Schumach.) DC. on *Viola sororia* Willd., MN: Hennepin Co., Minnetonka, Thiel, MPPD-3426.

This specimen was identified as the aecial state of a rust fungus which otherwise is reported from the southeastern United States only as far northwest as Tennessee (6). The large urediniospores in the MPPD specimen reveal it to be *P. violae*. Thus, *U. andropogonis* should be deleted from the Minnesota flora.

#### 30. *Uromyces ari-triphylli* (Schwein.) Seeler in Guba & Seeler

Specimens examined: II on *Arisaema dracontium* (L.) Schott, MN: Houston Co., Mayville, 1899, Lyon 239, MIN-084348; Reno, 1976, G.B. Ownbey 5364 & Wheeler, MIN-799943 ex MIN-697791.

This is a new host species in Minnesota for a rust fungus known previously on *A. triphyllum* (L.) Schott from 17 counties (3).

#### 31. *Uromyces dictyosperma* Ellis & Everh. ex Tranz.

Specimens examined: II on *Euphorbia spathulata* Lam., MN: Redwood Co., Delhi, 1982, Nieterling, MIN-799961 ex MIN-743563; Rock Co., Blue Mounds St. Park, 1946, J.W. Moore 18690 & Huff, MIN-799709 ex MIN-442088; II, III, Chippewa Co., Montevideo, 1894, Moyer, MIN-799 913 ex MIN-148699.

This new rust species for Minnesota was previously reported from the western United States as far east as the Dakotas (6,8). The tuberculate teliospores readily distinguish it from *U. euphorbiae* Cke. & Peck in Peck, which is widespread in Minnesota on several weedy spurge species.

#### 32. *Uromyces geranii* (DC.) Lev.

Specimens examined: OI of *Puccinia polygoni-amphibii* on *Geranium maculatum* L., MN: Anoka Co. (MIN-369851, -575074); Carver Co. (MPPD-195); Chisago Co. (MIN-36967x); Dakota Co. (MIN-145043); Hennepin Co. (MIN-145050, MPPD-197, -1889, -3457); Mower Co. (MIN-744880); Pine Co.

(MIN-369688); Ramsey Co. (MIN-145034, MPPD-1888); Scott Co. (McCain 89006); Washington Co. (MIN-697956).

Freeman (2) listed *Aecidium geranii* DC. from Crow Wing, Houston, Meeker, Ramsey, and Winona counties, with the notation "belongs probably to *Uromyces geranii*." This report must have been copied by Preston and Dosdall (3), but none of Freeman's specimens can be found in MPPD. The inoculations connecting aecia on this cranesbill species to *P. polygoni-amphibii* were done shortly after Freeman's paper was published (8). All the available, later Minnesota specimens are of the *Puccinia* species, so there is no evidence to support keeping *U. geranii* in the state rust list.

33. *UROMYCES HEDYSARI-PANICULATI* (Schwein.) Farl. in Ellis

Specimen examined: II,III on *Desmodium canadense* (L.) DC., MN: Steele Co., Blooming Prairie, 1981, Smith 5277, MIN-746514.

This is a new host species for this rust fungus in Minnesota. The rust was previously reported from this state on *D. glutinosum* (Muhl. ex Willd.) Wood and *D. sp. indet.* (3).

34. *UROMYCES PLUMBARIUS* Peck

Specimen examined: II on *Gaura coccinea* Nutt., MN: Lac Qui Parle Co., Nassau, 1979, Smith 1276, MIN-707957.

This is the first report of this rust fungus species from Minnesota, and the first report of any rust on *Gaura* in this state.

35. *UROMYCES SILPHII* Arth.

Specimens examined: II,III on *Juncus dudleyi* Wieg., MN: Faribault Co., Walnut Lake, 1950, J.W. Moore 20748, MIN-799925 ex MIN-507293; Kittson Co., Lancaster, 1958, J.W. Moore 24076, & Heig, MN-799928 ex MIN-566235; Lincoln Co., Lake Benton, 1891, Sheldon 1366, MIN-799959 ex MIN-085927; and Wright Co., Albion Lake, 1981, Smith 5827, MIN-799927 ex MIN-746377;

- on *J. interior* Wieg., Mower Co., LeRoy, 1982, Smith 7424, MIN-758973; Redwood Co., Morgan, 1979, Wheeler 4604, MIN-799957 ex MIN-709603;

- and on *J. tenuis* Willd., Hubbard Co., Akeley, 1988, McCain 88010, MPPD-40079; St. Louis Co., Virginia, 1989, McCain 89015, MPPD-40100.

The rust specimens on *J. tenuis* extend the range within Minnesota 200 miles from the previous report in Wabasha Co. (3). Both *J. interior* and *J. dudleyi* are new hosts for this rust in this state.

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