

Appendices

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CHAPTER 9

APPENDICES

9.1. Appendix A

A Comparison of the Classifications of *Viola* Subsection *Boreali-Americanae* and its Taxa as recognized by Various Authors

DE GINGINS (1824)
Section *Nomimum* Ging.
Group I

V. pedata
V. palmata
V. asarifolia
V. papilionacea
V. cucullata
V. ovata
V. sagittata
V. villosa
(plus additional *Viola* species)

GRAY (1848)*

V. cucullata
V. palmata
V. sagittata

V. pedata

GRAY (1856)*

V. cucullata
V. cucullata var. *palmata*
V. sagittata
V. delphinifolia
V. pedata

GRAY (1889)*

V. palmata var. *cucullata*
V. palmata
V. sagittata
V. pedatifida
V. pedata

REICHE & TAUBERT (1895)
Sparsifoliae Reiche
Ser. 2 *Herbaceae*
Nomimum Ging. (*sensu stricto*)
Rostellatae
Stemless Plants

V. pedata
V. sagittata
V. palmata var. *palmata*
V. palmata var. *cucullata*
V. pedatifida
(plus additional *Viola* species)

* = no supraspecific ranking is provided; additional *Viola* species are listed.

BRainerd (1921, 1924)*

BECKER (1925)

Section *Nomimum* Ging."N." *Boreali-Americanae* W. Bckr.

29 species, 3 varieties

12 species

*V. affinis**V. brittoniana**V. chalcosperma**V. cucullata**V. egglestonii**V. emarginata**V. emarginata* var. *acutiloba**V. esculenta**V. fimbriatula**V. floridana**V. hirsutula**V. langloisii**V. langloisii* var. *pedatiloba**V. latiuscula**V. lovelliana**V. missouriensis**V. nephrophylla**V. novae-angliae**V. palmata**V. papilionacea**V. pedatifida**V. rosacea**V. sagittata**V. septemloba**V. septentrionalis**V. sororia**V. stoneana**V. triloba**V. triloba* var. *dilatata**V. viarum**V. villosa**V. brittoniana**V. cucullata**V. emarginata**V. fimbriatula**V. nuevo-leonensis**V. palmata**V. papilionacea**V. pedatifida**V. sagittata**V. septentrionalis**V. sororia**V. villosa*"O." *Pedatae* Pollard*V. pedata**V. pedata*

* = no supraspecific ranking is provided.

CLAUSEN (1929)Section "*Nominium*" [sic] Ging.Subsection *Plagiostigma* Godr."VIII." *Boreali-Americanae* W. Beckr.

20 species

*V. affinis**V. brittoniana**V. cucullata**V. emarginata**V. fimbriatula**V. hirsutula**V. langloisii**V. latiuscula**V. lovelliana**V. missouriensis**V. nephrophylla**V. papilionacea**V. palmata**V. pedata**V. sagittata**V. septemloba**V. septentrionalis**V. sororia**V. triloba**V. villosa***BAIRD-BRAINERD (1942)**Section *Nominium**Boreali-Americanae*

28 species, 2 varieties

*V. affinis**V. brittoniana**V. chalcosperma**V. cucullata**V. egglestonii**V. emarginata**V. esculenta**V. fimbriatula**V. floridana**V. hirsutula**V. langloisii**V. langloisii* var. *pedatiloba**V. latiuscula**V. lovelliana**V. missouriensis**V. nephrophylla**V. novae-angliae**V. papilionacea**V. palmata**V. pedatifida**V. rosacea**V. sagittata**V. septemloba**V. septentrionalis**V. sororia**V. stoneana**V. triloba**V. triloba* var. *dilatata**V. viarum**V. villosa***CLAUSEN (1951, 1964)**Section *Plagiostigma*1951: Subsection *Boreali-Americanae*

–20 species (not listed)

1964: Subsection *Boreali-Americanae*

W. Beckr.—approximately 30 species

(a few species listed as examples)

1951: Subsection *Pedatae*

–1 species

BRIZICKY (1961)Section *Plagiostigma* Godr.Subsection *Boreali-Americanae* W. Becker

25 species (a few species listed as

examples)

Subsection *Pedatae* Pollard*V. pedata*

FERNALD (1950)*	ALEXANDER (1952)*	GLEASON & CRONQUIST (1963)*	RUSSELL (1965)
27 species 4 varieties	24 species 3 varieties	24 [23] species 4 [3] varieties	Stemless Blue Violets 24 species 1 variety
<i>V. affinis</i>	<i>V. affinis</i>	<i>V. affinis</i>	<i>V. affinis</i>
<i>V. brittoniana</i>	<i>V. brittoniana</i> var. <i>brittoniana</i> var. <i>pectinata</i>	<i>V. brittoniana</i>	<i>V. brittoniana</i>
<i>V. pectinata</i>			
<i>V. chalcosperma</i>		<i>V. chalcosperma</i>	
<i>V. cucullata</i> <i>V. cucullata</i> var. <i>microtitis</i>	<i>V. cucullata</i>	<i>V. cucullata</i>	<i>V. cucullata</i>
<i>V. eglestonii</i>	<i>V. eglestonii</i>	<i>V. eglestonii</i>	<i>V. eglestonii</i>
<i>V. emarginata</i> <i>V. emarginata</i> var. <i>acutiloba</i>	<i>V. emarginata</i>	<i>V. emarginata</i> [<i>V. emarginata</i> var. <i>acutiloba</i>]	
<i>V. esculenta</i>	<i>V. esculenta</i>	<i>V. esculenta</i>	<i>V. esculenta</i>
<i>V. fimbriatula</i>	<i>V. fimbriatula</i>	<i>V. fimbriatula</i>	<i>V. fimbriatula</i> <i>V. floridana</i>
<i>V. hirsutula</i>	<i>V. hirsutula</i>	<i>V. hirsutula</i>	<i>V. hirsutula</i>
<i>V. langloisii</i>			<i>V. langloisii</i>
<i>V. latiuscula</i>	<i>V. latiuscula</i>	<i>V. latiuscula</i>	
<i>V. lovelliana</i>	<i>V. lovelliana</i>		<i>V. lovelliana</i>
<i>V. missouriensis</i>	<i>V. missouriensis</i>	<i>V. missouriensis</i>	<i>V. missouriensis</i>
<i>V. nephrophylla</i>	<i>V. nephrophylla</i>	<i>V. nephrophylla</i>	<i>V. nephrophylla</i>
<i>V. novae-angliae</i>	<i>V. novae-angliae</i>	<i>V. novae-angliae</i>	<i>V. novae-angliae</i>
<i>V. palmata</i>	<i>V. palmata</i>	<i>V. palmata</i>	<i>V. palmata</i>
<i>V. papilionacea</i>	<i>V. papilionacea</i> var. <i>papilionacea</i> var. <i>priceana</i>	<i>V. papilionacea</i> var. <i>papilionacea</i> var. <i>priceana</i>	
<i>V. pedatifida</i>	<i>V. pedatifida</i>	<i>V. pedatifida</i>	<i>V. pedata</i> <i>V. pedatifida</i> <i>V. pratincola</i>
<i>V. sagittata</i>	<i>V. sagittata</i>	<i>V. sagittata</i> var. <i>subsagittata</i>	<i>V. sagittata</i>
<i>V. septemloba</i>	<i>V. septemloba</i>	<i>V. septemloba</i>	<i>V. septemloba</i>
<i>V. septentrionalis</i> <i>V. septentrionalis</i> var. <i>grisea</i>	<i>V. septentrionalis</i>	<i>V. septentrionalis</i>	<i>V. septentrionalis</i>
<i>V. sororia</i>	<i>V. sororia</i>	<i>V. sororia</i>	<i>V. sororia</i>
<i>V. stoneana</i>	<i>V. stoneana</i>	<i>V. stoneana</i>	
<i>V. triloba</i> <i>V. triloba</i> var. <i>dilatata</i>	<i>V. triloba</i> var. <i>triloba</i> <i>V. triloba</i> var. <i>dilatata</i>	<i>V. triloba</i> var. <i>triloba</i> <i>V. triloba</i> var. <i>dilatata</i>	<i>V. triloba</i> var. <i>triloba</i> <i>V. triloba</i> var. <i>dilatata</i>
<i>V. viarum</i>	<i>V. viarum</i>	<i>V. viarum</i>	<i>V. viarum</i>
<i>V. villosa</i>	<i>V. villosa</i>	<i>V. villosa</i>	<i>V. villosa</i>

* = no supraspecific ranking is provided.

CRONQUIST (<i>in</i> GLEASON & CRONQUIST, 1991)	MCKINNEY (1992)	GIL-AD (1995, 1997)
No supraspecific ranking provided	Section “ <i>Nominum</i> ” [<i>sic</i>] Ging. Subsection <i>Plagiostigma</i> Godr.	Section <i>Plagiostigma</i> Godr. Subsection <i>Boreali-Americanae</i> (W. Becker) Gil-ad 16 species 1 subspecies, 1 form
6 species 1 variety	10 species 2 subspecies, 4 varieties	
		<i>V. affinis</i>
[<i>V. palmata</i> var. <i>palmata</i>] [<i>V. palmata</i> var. <i>palmata</i>]	<i>V. pedatifida</i> subsp. <i>brittoniana</i>	<i>V. brittoniana</i> f. <i>brittoniana</i> <i>V. brittoniana</i> f. <i>pectinata</i>
<i>V. cucullata</i>	<i>V. cucullata</i>	<i>V. cucullata</i>
[<i>V. palmata</i> var. <i>pedatifida</i>]	<i>V. septemloba</i> subsp. <i>egglestonii</i>	<i>V. egglestonii</i>
	<i>V. sagittata</i> var. <i>ovata</i>	<i>V. fimbriatula</i>
	<i>V. hirsutula</i>	
	<i>V. sororia</i> var. <i>missouriensis</i>	<i>V. missouriensis</i>
<i>V. nephrophylla</i>	<i>V. sororia</i> var. <i>affinis</i>	<i>V. nephrophylla</i>
	<i>V. sororia</i> var. <i>novae-angliae</i>	<i>V. novae-angliae</i> subsp. <i>novae-angliae</i> <i>V. novae-angliae</i> subsp. <i>grisea</i>
	<i>V. pedata</i>	<i>V. nuevo-leonensis</i>
<i>V. palmata</i> var. <i>palmata</i>	<i>V. palmata</i>	
<i>V. palmata</i> var. <i>pedatifida</i>	<i>V. pedatifida</i> subsp. <i>pedatifida</i>	<i>V. pedatifida</i>
<i>V. sagittata</i>	<i>V. sagittata</i> var. <i>sagittata</i>	<i>V. sagittata</i>
[<i>V. palmata</i> var. <i>palmata</i>]	<i>V. septemloba</i> subsp. <i>septemloba</i>	<i>V. septemloba</i>
		<i>V. septentrionalis</i>
<i>V. sororia</i>	<i>V. sororia</i> var. <i>sororia</i>	<i>V. sororia</i>
	<i>V. subsinuata</i>	
[<i>V. palmata</i> var. <i>palmata</i>]		<i>V. triloba</i>
<i>V. villosa</i>	<i>V. villosa</i>	<i>V. villosa</i>

9.2. Appendix B

Synonyms and Published Combinations of Albinos, Putative Hybrids and Putative Introgessants of *Viola* Subsection *Boreali-Americanae*

Introduction

This appendix outlines synonyms and published combinations of albinos, putative hybrids and putative introgressants of *Viola* subsection *Boreali-Americanae*. Although the citations provided here could be divided into four categories: names published for albinos, nomenclatural synonyms, putative taxonomic synonyms, and names that apparently have been given to putative hybrids and introgressants, the names that could be placed in one of the first three categories could also be placed in the last category. A search for mature seeds that would allow SEM examinations of the seed coats of seeds was conducted at NDG on the specimens of names published by E. L. Greene. The results indicated that most do not carry mature seeds, and therefore the identity of these taxa could not be revealed. Since *Viola* is usually collected during chasmogamous anthesis, this will likely turn out to be true for the specimens of the other combinations outlined here that have not been examined. For ease of reference, the citation of a combination published for albinos is given just after homotypic combinations if it has been published. Some of the combinations listed under *Viola fimbriatula* may be applicable to *V. sagittata* and vice versa. The list is not intended to be complete. It does not include synonyms and names that are affiliated with taxa that are hypothesized to be of hybrid origin (e.g., *V. papilionacea*) in this treatment.

Viola affinis LeConte in Ann. Lyceum Nat. Hist. New York 2: 138. 1828.

Viola sororia subsp. *affinis* (LeConte) R. J. Little in Phytologia 80: 295. 1996.

Viola sororia var. *affinis* (LeConte) L. E. McKinney in Sida Bot. Misc. 7: 39. 1992.

Viola affinis f. *albiflora* L. K. Henry in Castanea 18: 45. 1953.

Viola affinis var. *subarctica* J. Rousseau in Canad. J. Res. 28 C: 245. 1945.

Viola crenulata Greene in Pittonia 4: 295. 1901.

Viola nepetaefolia Greene in Pittonia 5: 92. 1902.

Viola venustula Greene in Pittonia 3: 335. 1898.

Viola brittoniana Pollard in Bot. Gaz. (Crawfordsville) 26: 332. 1898.

Viola atlantica Britton in Bull. Torrey Bot. Club 24: 92. 1897, non Pomel. 1874.

Viola pedatifida subsp. *brittoniana* (Pollard) L. E. McKinney in Sida Bot. Misc. 7: 22. 1992.

Viola baxteri House in New York State Mus. Bull. 254: 500. 1924.

Viola cucullata Aiton, Hort. Kew. 3: 288. 1789.

Viola palmata var. *cucullata* (Aiton) A. Gray in Bot. Gaz. (Crawfordsville) 11: 254. 1886.

Viola cucullata f. *albiflora* Britton in Bull. Torrey Bot. Club 17: 124. 1890.
Viola cucullata δ *alba* Torr. & A. Gray, Fl. N. Amer. 1: 137. 1838.

Viola cucullata ϵ *reniformis* Torr. & A. Gray, Fl. N. Amer. 1: 137. 1838.
Viola cucullata var. *macrotis* (Greene) W. Stone in Proc. Acad. Nat. Sci. Philadelphia 55: 673. 1903. *Viola macrotis* Greene in Pittonia 5: 97. 1902.
Viola cucullata var. *leptosepala* (Greene) W. Stone in Proc. Acad. Nat. Sci. Philadelphia 55: 674. 1903. *Viola leptosepala* Greene in Pittonia 5: 98. 1902.
Viola oconensis House in Torreya 7: 137, Fig. 4. 1907.
Viola cucullata var. *microtitis* Brainerd in Rhodora 15: 112. 1913.
Viola cucullata f. *prionosepala* (Greene) Brainerd in Rhodora 15: 112. 1913. *Viola prionosepala* Greene in Pittonia 5: 99. 1902.
Viola cucullata f. *thurstonii* (A. Twining) House in New York State Mus. Bull. 254: 504. 1924. *Viola cucullata* var. *thurstonii* A. Twining, Fl. N.E. Pennsylvania: 52. 1917.

Viola egglestonii Brainerd in Bull. Torrey Bot. Club 37: 526, plates 34 & 35. 1910.
Viola septemloba subsp. *egglestonii* (Brainerd) L. E. McKinney in Sida Bot. Misc. 7: 33. 1992.

Viola fimbriatula Sm. in Rees, Cycl. 37: *Viola* No. 16. 1817.

Viola fimbriatula f. *albescens* Farw. in Amer. Midl. Naturalist 11: 66. 1928.
Viola alleghaniensis Roem. & Schult., Syst. Veg. 5: 360. 1819.
Viola sagittata var. *ovata* (Nutt.) Torr. & A. Gray, Fl. N. Amer. 1: 138. 1838. *Viola ovata* Nutt., Gen. N. Amer. Pl. 1: 148. 1818.
Viola sagittata Paine, Cat. Pl. Oneida Co.: 63. 1865, non Aiton. 1789.
Viola sagittata var. *hicksii* Pollard, Bot. Gaz. (Crawfordsville) 20: 326. 1895. *Viola ovata* var. *hicksii* (Pollard) Pollard in Proc. Biol. Soc. Washington 10: 92. 1898.
Viola amorphophylla Pollard in Proc. Biol. Soc. Washington 13: 129. 1900.
Viola aberrans Greene ex W. Stone in Proc. Acad. Sci. Philadelphia 55: 683, pl. 37, Fig. 4-6. 1903.
Viola fimbriatula var. *glabra* Pennell in Bartonica 12: 19. 1931.

Viola missouriensis Greene in Pittonia 4: 141. 1900.

Viola candidula Nieuwl. in Amer. Midl. Naturalist 3: 85, pl. 2-3. 1913.
Viola lucidifolia Newbro. in Stud. Nat. Hist. Iowa Univ. 17: 56, pl. 4 Fig. 3, pl. 8 Fig. 24-25. 1936.
Viola sororia var. *missouriensis* (Greene) L. E. McKinney in Sida Bot. Misc. 7: 42. 1992.

Viola nephrophylla Greene in Pittonia 3: 144. 1896.

Viola nephrophylla f. *albinea* Farw. in Amer. Midl. Naturalist 11: 64. 1928.
Viola vagula Greene in Pittonia 4: 67. 1899.
Viola austinae Greene in Pittonia 5: 30. 1902.
Viola galacifolia Greene in Pittonia 5: 30. 1902.
Viola subjuncta Greene in Pittonia 5: 31. 1902.
Viola peramoena Greene in Pittonia 5: 94. 1902.
Viola subrotunda Greene in Pittonia 5: 118. 1902.

- Viola mccabeiana* M. S. Baker in *Madroño* 5: 226, Pl. 22 Fig. 5, Pl. 23. 1940.
Viola nephrophylla var. *arizonica* (Greene) Kearny & Peebles in *J. Wash. Acad. Sci.* 29: 487. 1939. *Viola arizonica* Greene in *Pittonia* 5: 33. 1902.
Viola nephrophylla f. *bicolor* Boivin in *Nat. Canad.* 87: 49. 1960.
Viola nephrophylla var. *cognata* (Greene) C. L. Hitchc., *Vasc. Pl. Pacific Northwest* 3: 445. 1961. *Viola cognata* Greene in *Pittonia* 3: 145. 1896.

- Viola novae-angliae*** House in *Rhodora* 6: 226, Plate 59. 1904.
Viola sororia var. *novae-angliae* (House) L. E. McKinney in *Sida Bot. Misc.* 7: 44. 1992.

- Viola pedatifida*** G. Don, *Gen. Hist.* 1: 320. 1831.
Viola palmata var. *pedatifida* (G. Don) Cronquist in *Gleason & Cronquist, Manual Pl. Northeastern U.S.* ed. 2: 864. 1991.

- Viola delphinifolia* Nutt. ex Torr. & A. Gray, *Fl. N. Amer.* 1: 136. 1838.
Viola pedatifida var. *bernardi* Greene in *Pittonia* 3: 259. 1898.
Viola indivisa Greene in *Pittonia* 5: 124. 1903.

- Viola sagittata*** Aiton, *Hort. Kew.* 3: 287. 1789.

- Viola dentata* Pursh, *Fl. Amer. Sept.*: 172. 1813.
Viola sagittata var. *subsagittata* (Greene) Pollard in *Bot. Gaz. (Crawfordsville)* 26: 340. 1898. *Viola subsagittata* Greene in *Pittonia* 3: 315. 1898.
Viola sagittata var. *secedens* (Greene) Farw. in *Amer. Midl. Naturalist* 12: 68. 1930. *Viola secedens* Greene in *Pittonia* 5: 121. 1903.
Viola sagittata var. *glabra* Pennell in *Bartonia* 12: 19. 1931.
Viola sagittata f. *carlii* Creutz in *Wild Flower* 35: 9, Fig. 2. 1959.
Viola sagittata f. *umbelliflora* (Fernald) Scoggan, *Fl. Canada* 1: 52. 1978. *Viola fimbriatula* f. *umbelliflora* Fernald in *Rhodora* 51: 56. 1949.

- Viola septemloba*** LeConte in *Ann. Lyceum Nat. Hist. New York* 2: 141. 1828.

- Viola vicinalis* Greene in *Pittonia* 4: 9. 1899.
Viola insignis Pollard in *Bot. Gaz. (Crawfordsville)* 26: 344. 1898, non Richter. 1886.

- Viola septentrionalis*** Greene in *Pittonia* 3: 334. 1898.

- Viola septentrionalis* f. *alba* Vict. & J. Rousseau in *Contr. Inst. Bot. Univ. Montréal* 36: 20. 1940.

- Viola macounii* Greene in *Pittonia* 3: 335. 1898.
Viola subviscosa Greene in *Pittonia* 4: 293. 1901.
Viola fletcheri Greene in *Pittonia* 4: 296. 1901.
Viola nesiotica Greene in *Pittonia* 5: 102. 1902.

- Viola sororia*** Willd., *Hort. Berol.*: Tab. 72. April 1806.
Viola cucullata γ *sororia* (Willd.) Torr. & A. Gray, *Fl. N. Amer.* 1: 137. 1838.
Viola palmata var. *sororia* (Willd.) Pollard in *Bot. Gaz. (Crawfordsville)* 26: 332. 1898.

Viola sororia f. *beckwithae* House in New York State Mus. Bull. 243-244: 40. 1923.
Viola sororia f. *pallida* F. Seymour, Fl. New England: 395. 1969.
Viola asarifolia Pursh, Fl. Amer. Sept.: 732. 1813.
Viola cuspidata Greene in Pittonia 3: 314. 1898.
Viola dicksonii Greene in Pittonia 4: 65. 1899.
Viola sororia var. *incognita* Lacey in Sida 3: 312. 1969.
Viola sororia f. *priceana* (Pollard) Cooperr. in Michigan Bot. 23: 167. 1984. *Viola priceana*
Pollard in Proc. Biol. Soc. Washington 16: 127. 1903.

Viola triloba Schwein. in Amer. J. Sci. Arts 5: 57. 1822.

Viola triloba f. *albida* Steyerm. in Rhodora 54: 256. 1952.

Viola cucullata β *congener* (LeConte) Torr. & A. Gray, Fl. N. Amer. 1: 137. 1838. *Viola congener* LeConte in Ann. Lyceum Nat. Hist. New York 2: 140. 1828.

Viola vespertilionis Greene in Leaf. Bot. Observ. Crit. 1: 217. 1906.

Viola ornithodes Greene in Leaf. Bot. Observ. Crit. 1: 218. 1906.

Viola triloba f. *dilatata* (Elliott) E. J. Palmer & Steyerm. in Brittonia 10: 115. 1958. *Viola triloba* var. *dilatata* (Elliott) Brainerd in Bull. Torrey Bot. Club 37: 587. 1911. *Viola palmata* var. *dilatata* Elliott, Sketch Bot. S. Carolina 1: 300. 1817.

Viola villosa Walter, Fl. Carol.: 219. 1788.

Viola alabamensis Pollard in Proc. Biol. Soc. Washington 13: 169. 1900.

Viola carolina Greene in Pittonia 3: 259. 1898.

9.3. An Introduction to Appendices C and D

Abbreviations for the reproductive phases in the citations of representative specimens.

– The reproductive phase of the plants mounted on a given specimen of *Viola*, and consequently the type of organs available for examination, are important in determining the type and value of information that could be extracted from the specimen. Therefore, a listing of the reproductive organs available on each representative specimen cited was added to the standard format. Following the abbreviation of the herbarium that is given in parentheses, the following abbreviations may be listed: **CH** = chasmogamous flowers; **CL** = cleistogamous flowers; **C** = capsules; **S** = mature seeds; **IMS** = immature seeds (the pigmentation of the seeds is missing, and they may also be shrunken); **CUL** = cultivated. In cases in which both chasmogamous and cleistogamous plants are mounted on the same sheet (or on serial sheets) and dates are listed, abbreviations for the reproductive phase: **CHP** = a chasmogamous plant; **CLP** = a cleistogamous plant, follow the respective date within the standard citation, and the abbreviations for the reproductive organs follow the herbarium abbreviation. In most cases when only chasmogamous (CH) and seeds (S) are listed, a chasmogamous specimen was made at the time of collection, and seeds were harvested in the greenhouse from a sibling plant cultivated in the greenhouse.

Specimens of putative hybrids and introgressants cited in Appendix C. – For some taxa, citations of specimens whose seeds were examined under SEM and were determined as putative hybrids or putative introgressants, follow the citations of the representative specimens of the orthospecies. These putative hybrids or introgressants were initially grouped with the respective orthospecies (see the procedure for discerning the orthospecies outlined in Chapter 4, Section 4.3). Specimens whose putative association with orthospecies could not be determined, and are cited in the text, are listed at the end of Appendix C.

9.4 Appendix C

Representative Specimens of *Viola* Subsection *Boreali-Americanae*

Viola affinis LeConte

CANADA. ONTARIO, Essex County: Mersea Township, Point Pelee National Park, 26 July 1977, *A. A. Reznicek, P. F. Maycock, & D. R. Gregory s.n.* (MICH) CL, C, IMS. U.S.A. – PENNSYLVANIA. Philadelphia: near Tacony Creek, 3 June 1899, *C. L. Pollard 6* (MICH) C. Chester County: woods adjacent to the intersection of PA Route 82 and German Hollow Road, 11 May 1990: CHP, 20 May 1991: CLP, *N. L. Gil-ad 271* (MICH) CH/CL, C, S. – VERMONT. Grand Isle County: North Hero, borders of Lake Champlain, 20 May 1904, *E. Brainerd 1* (US) CH; *E. Brainerd 2* (US) C, S.

Additional specimens examined (putative hybrids): NEW JERSEY. Monmouth County: Allaire State Park, 0.3 miles NW of the park's main office on NJ Road 524A, 12 May 1990, *N. L. Gil-ad 274* (MICH) CL, C, S. Burlington County: Mount Laurel Township, 0.3 mile S of the intersection of Walton Avenue and Union Mill Road, 29 April 1991: CHP, 20 May 1991: CUL, *N. L. Gil-ad 461* (MICH) CH, C/CL, C, S. – PENNSYLVANIA. Berks County: Union Township, 0.1 mile E of 464 Park Road, 11 May 1990, 23 May 1991: CUL, *N. L. Gil-ad 270* (MICH) CL, C, S.

Viola brittoniana Pollard f. *brittoniana*

U.S.A. CONNECTICUT. Fairfield County: Stratford, 31 May & 25 June 1901, *E. H. Eames 135/135a* (MICH) CH, CL, C, S. DELAWARE. Kent County: Bombay Hook, 10 June 1880, *A. Commons s.n.* (NY) CL. – MARYLAND. Prince Georges County: Hyattsville, 25 June 1899, *W. R. Maxon & C. L. Pollard 3* (MICH) CL, C. – MASSACHUSETTS. Middlesex County: Town of Bedford, Great Meadows National Wildlife Refuge, 2.3 miles SW of the intersection of Routes 225 and 62, W of the west end of Bonnievale Drive, 17 June 1990, CUL–14 May 1991: CHP, 11 Aug. 1991: CL, *N. L. Gil-ad 323* (MICH) CH/CL, S; Town of Carlisle, Greenough Conservation Land W of Concord River off 528 Maple Street, 17 June 1990, CUL–14 May 1991: CHP, *N. L. Gil-ad 324* (MICH) CH/CL, S. Norfolk County: Dedham, meadow along the Charles River, 22 May 1910 & 23 Aug. 1910, *Ex Horto Brainerd 17* (US, VT) CH, CL, C, S. – NEW JERSEY. Burlington County: 2.6 miles SW of the intersection of County Roads 616 and 630, 25 meters S of County Road 663, 30 April 1991 *N. L. Gil-ad 463* (MICH) CH, CL, S. Mercer County: Princeton Junction, 28 May 1907, *E. B. Bartram 5515* (MICH) CH. Ocean County: 0.85 mile E of the intersection of NJ Route 9 and Game Farm Road in Forked River, 28 April 1991: CHP, 9 Aug. 1991: CLP, *N. L. Gil-ad 460* (MICH) CH/CL, S. – NEW YORK. Staten Island, 8 June 1888, *N. L. Britton s.n.* (lectotype: NY!) CH, C; May 1893, *N. L. Britton s.n.* (NY) CH. – NORTH CAROLINA. Bertie County: one mile SE of the intersection of NC Route 42E/11 Bypass and NC Route 305 in Aulander, 22 April 1991: CHP, 9 Aug. 1991: CUL, *N. L. Gil-ad 452* (MICH) CH/CL, C, S. Currituck County: 2.3 miles N of Grandy on U.S. Highway 158, 8 May 1958, *H. E. Ahles 40163* (MICH) CH, C. Gates County: 2.6 miles NE of the intersection of U.S. Route 13 and U.S. Route 158 NE of Winton, 22 April 1991: CHP, 9 July 1991 and 11 June 1992: S, *N. L. Gil-ad 454* (MICH) CH, C, S. – SOUTH CAROLINA. Horry County: 2 miles SE of Conway by U.S. Highway 701, *W. W. Thomas 741* (MICH) CH, C.

Additional specimen examined (putative hybrid): NEW JERSEY. Atlantic County: 0.3 mile N of the intersection of NJ Route 49 and Hunters Mill Road, 28 April 1991, *N. L. Gil-ad 459* (MICH) CH, CUL: S.

Viola brittoniana f. *pectinata* (E. P. Bicknell) Gil-ad

U.S.A. CONNECTICUT. Fairfield County: Stratford, 30 June 1905, *E. H. Eames 5257* (MICH) CL, C. – MASSACHUSETTS. Norfolk County: Dedham, Charles River meadow, 25 July 1904, *F. F. Forbes s.n.* (MICH) C, S. Suffolk and Norfolk Counties Line: Blue Hills Reservation (Neponset River Reservation), ca. 0.5 mile W of Blue Hill Road along the north edge of Burma Road, 14 June 1990: CHP, 14 May 1991/11 Aug. 1991: CUL, *N. L. Gil-ad 319* (MICH) CH/CL, S. – NEW YORK. [Nassau County:] southwestern Long Island, Woodmere, 21 May 1904, *E. P. Bicknell s.n.* (holotype: NY!, isotype: GH) CH. – NORTH CAROLINA. Gates County: 2.6 miles NE of the intersection of U.S. Route 13 and U.S. Route 158 NE of Winton, 22 April 1991, *N. L. Gil-ad 453* (MICH) CH, CL, C, S.

Viola cucullata Aiton

U.S.A. MASSACHUSETTS. Bristol County: Caratunk Wildlife Refuge, 0.5 mile W of the intersection of Pine Street and Brown Avenue, 14 June 1990, *N. L. Gil-ad 321* (MICH) CH, CUL: S. – NEW JERSEY. Sussex County: High Point State Park, 0.3 miles NW of the intersection of NJ Route 23 and Kuser Road W of Kuser Road, 13 May 1990, *N. L. Gil-ad 276; 277* (MICH) CH, CL, C, S.

Additional specimens examined (putative hybrids): MAINE. Aroostook County: 5.1 miles W of the eastern townline of Allagash, on the southern flood shore of the Saint John River, 11 July 1993, *N. L. Gil-ad 485* (MICH) CL, S. Penobscot County: Eddington Township, 2.9 miles N of the intersection of ME Routes 178 and 9 in Eddington, 20 May 1990, *N. L.*

Gil-ad 298 (MICH) CH, CUL: S. – MICHIGAN. Hillsdale County: 0.4 mile S of the intersection of Mosherville Road and Concord Road E of the Kalamazoo River, T.5S., R.3W, Sec. 9, NE¹/₄, 27 May 1989, *N. L. Gil-ad 223* (MICH) CUL: C, S. Delta County: Cornell. T.40N., R.23W., Sec. 6, N¹/₂, NE¹/₄, on the SW bank of the Escanaba River, *N. L. Gil-ad 340* (MICH) CH, CUL: S. – NEW YORK. Onondaga-Cortland Counties Line: 0.3 miles SW of the intersection of Route 91 and Labrador Crossing Road, 23 May 1990, *N. L. Gil-ad 305* (MICH) CH, C, S; *N. L. Gil-ad 307* (MICH) C, S. Ulster County: Minnewaska State Park, 5.5 miles S of the intersection of NY Routes 209 and 299, 14 May 1990, *N. L. Gil-ad 282* (MICH) CH, CUL: S.

Viola egglestonii Brainerd

U.S.A. TENNESSEE. [Davidson County:] West Nashville, 26 May 1909, *W. W. Eggleston 4421* (isotype: VT!) CL, C; 10 May 1910, *Ex Horto Brainerd 43* (NY, US) CH; 14 July 1910, *Ex Horto Brainerd 44* (NY) C, S, (US) CL, C, S. Rutherford County: Ca. 0.2 miles NW of the intersection of Richland Road and Factory Road, 5 April 1994, *N. L. Gil-ad 494* (MICH) CH, C; LaVergne, 2.6 miles N of the intersection of Murfreesboro Road and Mason Road, ca. 0.1 miles S of Mason Road, E of Hurricane Creek, 5 April 1994, *N. L. Gil-ad 495* (MICH) CH; between Stones River Road and J. Percy Priest Lake, NW of Hollandale Road, 19 April 1992, *A. G. Moore s.n.* (MICH) CH, C, CUL: CL, C, S. Wilson County: 0.5 miles NW of the intersection of US Highway 231 and Fall Creek Road, E of Gwynn Road, 5 April 1994, *N. L. Gil-ad 493* (MICH) CH.

Viola fimbriatula Sm.

North America, dry hills from Canada to Virginia, 1817, *Francis Boott s.n.* (photo: MICH!) CH, C. U.S.A. NEW JERSEY. Sussex County: High Point State Park, 0.3 mile N of the intersection of NJ Road 23 and Kuser Road, 13 May 1990, *N. L. Gil-ad 279* (MICH) CH, C, S. – NEW YORK. Tioga County: at south limit of Cayuga Basin, NW of station at North Spencer, 10 May 1914, *L. H. MacDaniels & A. J. Eames 2853* (MICH) CH. – OHIO. Jefferson County: Springfield Township, Sec. 4, SW¹/₄, 0.2 miles SE of OH Route 164, 6 May 1983, *A. W. Cusick 22403* (MICH) CH.

Additional specimens examined (putative hybrids): MAINE. Orono, gravel, 5 Sep. 1898, *Fernald s.n.* (VT) CL, C, S. – MASSACHUSETTS. Berkshire County: 3 miles W of the intersection of MA Route 2 and U.S. Route 7 in Williamstown, 18 June 1990, *N. L. Gil-ad 332* (MICH) CH, CUL: S. Hampden County: Mount Tom State Preservation, Kay-Bee Trail, 17 June 1990, *N. L. Gil-ad 327* (MICH) CUL: CL, C, S. Norfolk County: Dedham, 507 Bridge Street on Route 109, 22 May 1990, *N. L. Gil-ad 302* (MICH) CH, C, S. – MICHIGAN. St. Claire County: near Port Huron, 16 May 1909: CHP, 4 July 1909: CLP, *C. K. Dodge s.n.* (MICH) CH/CL, C, S. Wayne County: Sumpter Township, T.4S., R.8E, Sec. 31, N¹/₂, field SW of old borrow pits; nearly 0.5 mile SW of the intersection of Arkona Road and Sherwood road, 1 Sep. 1990, *W. W. Brodowicz 776* (MICH) C, S. – NEW JERSEY. Cumberland County: Bridgeton City Park, 0.8 miles N of the intersection of Commerce Street and Park Drive, 28 April 1991, *N. L. Gil-ad 458* (MICH) CH, CUL: S. Sussex County: High Point State Park, 1.5 miles NE of the intersection of NJ Road 23 and Kuser Road, 0.5 mile NE of the intersection of Kuser Road and Monument Drive, 13 May 1990, *N. L. Gil-ad 281* (MICH) CH, CUL: S. – NEW YORK. Long Island. Nassau County: Westbury, along the old deserted road between Roosevelt Airport and Stewart Avenue, 6 June 1950, *L. A. Charette 784* (VT) CL, C, S. – VERMONT. [Rutland County:] Brandon, 14 May 1922: CHP, 28 July 1923: CLP, *N. L. Dutton s.n.* (MICH) CH/ C, S. – VIRGINIA. Wythe County: Jefferson National Forest, Stony Fork campground, south side of VA Highway 601, ca. 4 miles W of the intersection with I-75, ca. 7 miles N of Wytheville, 28 May 1992, *A. A. Reznicek s.n.* (MICH) CUL: C, S.

Viola missouriensis Greene

U.S.A. ILLINOIS. Champaign County: Urbana Township, 3 May 1914, *Crane 1471* (VT) CH, C, S; Champaign Township, 9 June 1914, *Crane 1627* (VT) CL, C, S. – MISSOURI. Clay County: Randolph, 23 April 1899, *K. Mackenzie 10* (NDG) CH; Randolph, 23 April 1899, *K. Mackenzie 11* (NDG) CH. [Jackson County:] Leeds, 19 April 1895, *B. F. Bush 231* (NDG) CH. Jackson County: Courtney, 10 May 1898, *B. F. Bush 108* (NDG) CH; Courtney, 10 May 1898, *B. F. Bush 95* (NDG; 2 sheets) C; Courtney, 30 April 1899, *B. F. Bush 70* (NDG) CH, (NY; 2 sheets); CH; Courtney, 30 April 1899, *B. F. Bush 88* (NDG) CH, (NY) CH. [Jackson County:] Independence, 24 April 1898, *K. Mackenzie 8* (NDG) CH. – TEXAS. Travis County: 0.9 miles SE of US Route 183, S of Burleson Road: at the west end of Precinct 4 County Park Parking, Lat. 30°10'28", Long. 97°40'31", 22 March 1991: CHP, 16 May 1991: CLP, *N. L. Gil-ad 390* (MICH) CH/CL, C, S; E of a clearing with navigation posts, Lat. 30°10'30", Long. 97°40'40", 16 May 1991: CHP, 16 May 1991: S, *N. L. Gil-ad 391* (MICH) CH, C, S.

Additional specimens examined (putative hybrids): NORTH CAROLINA. Nash County: 2.5 miles S of the intersection of U.S. Route 64 Alt. and NC Route 5815 in Spring Hope, 22 April 1991, *N. L. Gil-ad 449, 451* (MICH) CL, C, S.

Viola nephrophylla Greene

U.S.A. ARIZONA. Gila County: 20 miles NE of Payson, 9 April 1960, *Russell 11492* (MICH) CH. – CALIFORNIA. Modoc County: Modoc National Forest, T.44N., R.14E., Sec. 14, 1.5 miles NW of the intersection of Forest Road 30 and Plum Valley Road, 6 June 1990: CHP, 28 July 1991: CLP, *N. L. Gil-ad 317* (MICH, UC) CH/CL, C, S. Mono County: White Mountains, T.2/3S., R.33E., Sec. 32/5, along Pellissier Creek 3.1 miles S80°W of Mount Hogue Summit, 22 Aug. 1986, *J. D. Morefield 4355* (MICH) C, S (RSA) C, IMM. – COLORADO. the valley of the Cimarron River, 29 Aug. 1896, *E. L.*

Greene s.n. (holotype: NDG!) CH, C, S, (isotype: NDG!) C. Leyden, 1 Aug. 1911: CLP, 19 May 1912: CHP, *Cross 152* (VT) CL, C, S/CH. – NEW MEXICO. Las Vegas, Gallinas Canyon, 16 May 1934, *Studhalter & Marr 1661* (MICH) CH, C. – SOUTH DAKOTA. Lawrence County: 4 miles down Box Elder Creek from Nemo, Greek Bank, 12 June 1940, *P. Johnson 162* (MICH) CH. – UTAH. Washington County: T.39S., R.13W., E slope of Pine Valley Mountains, between Browse guard station and Syler Spring, 16 May 1984, *Atwood 9653* (BRY) CH; T.39S., R.14W., Sec. 19, Pine Valley Reservoir, 16 June 1986, *Warrick 1972* (BRY) CH, C.

Additional specimens examined (putative hybrids): CANADA. QUEBEC: Grand Cascapedia River, gravel bars and beaches, 15 July 1905, *Collins & Fernald 108* (VT) CL, C, S. U.S.A. MAINE. Aroostook County: 21.3 miles E of the intersection of ME Route 11 and County Road 161W in Fort Kent, 5-15 meters S of the St. John River, 11 July 1993, *N. L. Gil-ad 488* (MICH) CL, C, S/CUL: CH. – VERMONT. Grand Isle County: Providence Island, transplanted July 1905, 31 May 1910, *Ex Horto E. Brainerd 83* (US) CH; rocky shores of Lake Champlain, 4 & 22 July 1905, *E. Brainerd 84* (US) CL, C.

Viola novae-angliae House subsp. *novae-angliae*

CANADA. ONTARIO. Thunder Bay District: Paipoonge Twp., SW of Fort William, 12 June 1966, *Allin s.n.* (MICH) CH; U.S.A. MAINE. AROOSTOOK County: Saint Francis, Valley of the St. John River, 18 June 1898, *M. L. Fernald 2244* (US) CH; Fort Kent, Valley of the Saint John River, 15 June 1898, *M. L. Fernald 2245* (holotype: US!) CH buds; gravelly beach 1 mile below Fort Kent, 25 Aug. 1905, *M. L. Fernald s.n.* (VT) C, S; 21.3 miles W of the intersection of ME Route 11 and County Road 161W in Fort Kent, the southern floodshore S the Saint John River, 11 July 1993, *N. L. Gil-ad 487* (MICH) CL, C. Penobscot County: Veazie, by the Penobscot River, 22 August 1908, *M. L. Fernald 243* (MICH, US) CL, C, S; Old Town, on a rocky island on the Penobscot River NE of the intersection of North Main Street and Stillwater Street, 12 July 1993, *A. A. Reznicek & N. L. Gil-ad 490* (MICH) C. – MICHIGAN. Schoolcraft County: T.42N., R.16W., Sec. 23, S¹/₂, NW¹/₄, NE¹/₄, 27 May 1971, *D. Henson 53* (MICH) CH. – MINNESOTA. Koochiching County: 9 miles NE of Big Falls, 20 May 1952, *J. W. Moore 21588* (US) CH.

Additional specimens examined (putative hybrids): CANADA. ONTARIO. Thunder Bay District: Devon Twp., 2 km. N of Fallingsnow Lake, 26 May 1980, *C. G. Garton 19377a* (MICH) CH; Right bank of Weikwabinonaw Road at crossing of Great Lakes Forest Products Access Road to Buda Lake, 27 May 1981, *C. G. Garton 19945* (MICH) CH.

Viola novae-angliae subsp. *grisea* (Fernald) Gil-ad

U.S.A. MICHIGAN. Crawford County: T.27N., R.4W., Sec. 32, NE¹/₄ & SW¹/₄ of SE¹/₄, W of Howes Lake, 21 May 1992, *E. M. Chittenden 421* (MSC); 23 May 1993, *N. L. Gil-ad 470* (MICH) CH. CUL: S. Schoolcraft County: dry sandy plain near Driggs, 2 July 1934, *M. L. Fernald & H. S. Pease 3430* (holotype: GH!; Isotype: MICH!) C, S; Seney National Wildlife Refuge, T.45N., R.16W., Sec. 14, SW¹/₄, ca. 4 miles S of Creighton, 10 June 1986, *D. Henson 2024* (MICH) CH; 22 June 1987, *A. A. Reznicek 7940*; 16 Aug. 1987, *D. Henson 2387A* (MICH) CL, C; 13 June 1990, *N. L. Gil-ad 334* (MICH) CH, C, S.

Viola nuevo-leonensis W. Becker

MÉXICO. COAHUILA: Ca. 35 (air) km W of Cuatro Ciénegas, in Canyon de la Madera, 5 August 1973, *Henrickson 11962* (TEX) C, IMS; Cañon Desiderio ca. 9.4 miles by road W from Rancho Cerro de la Madera, 27°07'35"N, 102°31'37"W, *Wendt & Lott 1809* (LL) CH, C, IMS. NUEVO LEÓN. Chipinque, near branch of roads 25°55'N, 100°23'W, 7 April 1960, *Ford Smith M69* (TEX) CH, C; Municipio de San Pedro Garza García: Parque Chipinque, 9.9 km SE of the intersection of Av. Gómez Morin and Alfonso Reyes, 19 March 1990, *N. L. Gil-ad 384* (MICH) CUL: CL, C, S; 20 March 1990: CHP, 16 May 1991: CUL, *N. L. Gil-ad 389* (MICH) CH, C/CL, C, S; Mountains near Monterrey above La Mina, 6000 feet, July 1933, *Mueller & Mueller 67* (F) CL, C; Sierra Madre Mountains, Monterrey, 23 July 1933, *Mueller & Mueller 67* (GH) C, IMS; Sierra Madre supra Monterrey, 10 March 1906, *Pringle 10235* (holotype: HBG!, isotypes: BM!, CAS!, F!, GH!, MEXU!, MO!, NY!, US!) CH, C, (isotype: MICH!) CH.

Viola pedatifida G. Don

U.S.A. IOWA. Mills County: one mile N of Hastings at Wearin Prairie, West Nishnabotna River floodplain, 3 May 1992, *B. L. Wilson s.n.* (MICH) CH. CUL: S. Page County: Palmquist Prairie, one mile W and 0.25 mile N of Bethesda, 12 May 1992, *B. L. Wilson s.n.* (MICH) CH. CUL: S. Poweshiek County: SE of Grinnell, near Jasper County line, N of Scoutland, 13 May 1952, *Russell NR513521* (MICH) CH, C. – MICHIGAN. Kalamazoo County: T.4S., R.11W., Sec. 30, ca. 250 meters SE of the intersection of Highway 131 and XY Avenue West, June 1980, *H. E. Ballard, Jr. s.n.* (MICH) CH; 28 June 1990, *N. L. Gil-ad 333* (MICH) S. Delta County: T.39N., R.16W., Sec. 26, N¹/₄, NE¹/₄, 13 miles SW of the intersection of M183 and Route 2, W of M183, 3 July 1990, *N. L. Gil-ad 337* (MICH) C, S. Schoolcraft Township, 8 June 1935, *C. R. Hanes s.n.* (MICH) CH, CL, C. Washtenaw County: Lima Township, Sec. 26, SW¹/₄, near Mill Creek, 13 May 1973, *C. B. Nimke s.n.* (MICH) CH. – MINNESOTA. Ottertail County: Perham, 24 May 1910, *Z. L. Chandonnet s.n.* (MICH) CH. – WISCONSIN. Waukesha County: Delafield, north end of "Government Hill", 13 May 1906, *Ogden 85* (VT) CH, C.

Additional specimens examined (putative hybrids): MICHIGAN. Delta County: T.39N., R.19W., Sec. 26, W¹/₂, NE¹/₄, NW¹/₄, at the top of a limestone bluff, 9 June 1971, *D. Henson 114* (MICH) CH; T.39N., R.16W., Sec. 26, NE¹/₄, NW¹/₄,

ca. 0.4 mile W of the intersection of route 1122 and M183, 3 July 1990, *N. L. Gil-ad 338* (MICH) CH, CUL: S. IOWA. Page County: one mile N of Hastings at Plamquist Prairie, one mile west and 0.25 mile N of Bethesda, CUL: 3 May 1992; Field: 12 May 1992, *B. L. Wilson s.n.* (MICH) CH, C, S/ CH, S.

Viola sagittata Aiton

U.S.A. IOWA. Johnson County: T.80N., R.8W., Sec. 5, S of Williams Cemetery, 17 May 1992: CUL, *B. L. Wilson s.n.* (MICH) CL, C, S. – MICHIGAN. Hillsdale County: Litchfield Township, T.5S., R.4W., Sec. 23, NE¹/₄, 4.2 miles N of the intersection of MI Highway 12 and Cronk Road, 27 May 1989, *N. L. Gil-ad 222* (MICH) CH, CUL: S. Lenawee County: Deerfield Township, T.7S., R.5E., Sec 24, SW¹/₄, of SE¹/₄, N of Carroll, W of County Line Highway, 6 May 1987, *R. W. Smith 2096* (MICH) CH. – WISCONSIN. Marquette County: Vicinity of Silver Lake, 29 Aug. 1990, *A. A. Reznicek s.n.* (MICH) CH, CUL: S.

Additional specimens examined (putative hybrids): ILLINOIS. Kankakee County: Wichert, along the C&EI Railroad, 5 June 1908, *F. C. Gates 2431* (MICH) CH, CL, C, S. – KENTUCKY. Boyle County: 2 miles W of Junction City, 3 July 1937, *M. E. Wharton 661* (MICH) C, S. MICHIGAN. [Cass or Van Buren County:] Magician Lake, 13 Aug. 1915, *L. M. Umbach s.n.* (MICH) CL, C, S. Washtenaw County: Lyndon Township, T.1S., R.3E., Sec. 27, ca. 180 meters N of Long Lake, 6 May 1990, *N. L. Gil-ad 251* (MICH) CH, CUL: S. – MISSOURI. Barton County: Prairie State Park, 2.1 miles S of the intersection of the park's main road and County Road P, T.32N., R.33W., Sec. 20, NE¹/₄, NE¹/₄, 10 April 1991, *N. L. Gil-ad 421* (MICH) CH, CUL: S. – NORTH CAROLINA. Avery County: 2.7 miles S of the intersection of U.S. Road 19E and NC Road 194 in Ingalls, 18 April 1991, *N. L. Gil-ad 441* (MICH) CH, CUL: S. – WISCONSIN. Waukesha County: Nashotah, near Fair Oaks Pine Lake: 18 May 1906, *Ogden 31* (MICH) CH; 18 May 1906: CHP, 29 July 1906: CLP, *Ogden 38* (VT) CH/CL, C, S. – TEXAS. Newton County: 30.7 miles N of the intersection of I-10 and TX Route 87, 17 March 1991: CHP, 16 May 1991: CUL, *N. L. Gil-ad 381* (MICH) CH/CL, C, S.

Viola septemloba LeConte

U.S.A. FLORIDA. Marion County: Ocala National Forest, SE corner of the intersection of Road 88 and Highway 314, 1 April 1984, *Brunton & McIntosh 4889* (MICH) CH, C, IMM. Washington County: Falling Waters State Recreation Area, 2.4 miles SE of the intersection of I-10 and FL Route 77, ca. 43 meters N of the Picnic Area Parking Lot, 11 March 1991: CHP, 16 May 1991: CUL, *N. L. Gil-ad 366* (MICH) CH, C/ CL, C, S; Ca. 280 meters SW of the Picnic area Parking Lot, 11 March 1991: CHP, 14 May 1991: CUL, *N. L. Gil-ad 368* (MICH) CH, C/CL, C, S.

Additional specimens examined (putative hybrids): FLORIDA. Franklin County: Apalachicola National Forest, 0.6 miles from FL Route 65, T.5S., R.7W., Sec. 31, SW¹/₄, SW¹/₄, 5 March 1991: CHP, 9 May 1991: CUL, *N. L. Gil-ad 348* (MICH) CH, C/ CL, C, S. Liberty County: T.3S., R. 8W., Sec. 2, SW¹/₄, SW¹/₄, ca. 7 meters N of FL Road 379, 11 Aug. 1991: CUL, *N. L. Gil-ad 346* (MICH) CL, C, S. [Volusia County]: between DeLand and Deep Creek, 28 March 1909, *E. Brainerd s.n.* (VT) CH, S; Between DeLand and DeLeon Springs, 30 March 1909, *E. Brainerd s.n.* (VT) CH, C, one S. – MISSISSIPPI. Jackson County: Shepard State Park, 10.6 miles S of U.S. Route 90, 13 March 1991: CHP, 16 May 1991: CUL, *N. L. Gil-ad 372* (MICH) CH, C/CL, C, S.

Viola septentrionalis Greene

CANADA. ONTARIO. Algoma District, east side of Highway 17 at Blacktrout L., 4 miles N of the intersection of Highways 17 and 101, *C. G. Garton 14294* (MICH) CL, C. U.S.A. MAINE. [Locality not listed.] woods, Sep. 1907, *Ex Horto E. Brainerd* (V. 200) (VT) C, S. Hancock County: Birch Island, 27 June 1971, *McVaugh 25689* (MICH) CH. Penobscot County: 2.9 miles N of the intersection of ME Routes 178 and 9 in Eddington, 20 May 1990, *N. L. Gil-ad 299* (MICH) S. Waldo County: Moose Point State Park, 3.8 miles E of the intersection of U.S. Route 1 and County Road 141, 20 May 1990, *N. L. Gil-ad 301* (MICH) CH; 12 July 1993, *N. L. Gil-ad 492* (MICH) CL, C, S. – NEW HAMPSHIRE. Grafton County: White Mountain National Forest, ca. 4 miles E of the intersection of Trudeau Road and Main Street in Bethlehem, 18 May 1990, *N. L. Gil-ad 295* (MICH) CH, CUL: S.

Additional specimens examined (putative hybrids): MAINE. Penobscot County: Milford, 9 miles NE of the intersection of Routes 9 and 178 on the east bank of the Penobscot River, 20 May 1990, *N. L. Gil-ad 300* (MICH) CH, CUL: S. – MASSACHUSETTS. Worcester County: Wachusett Mountain State Reservation, ca. 3 meters N of the intersection of Bicentennial and Loop Trail, 16 June 1990, *N. L. Gil-ad 326* (MICH) C, CUL: S. – NEW HAMPSHIRE. Carrol County: 17 miles SE of the intersection of U.S. Highway 302 and NH Route 16, 18 May 1990, *N. L. Gil-ad 296* (MICH) CH, CUL: S.

Viola sororia Willd.

U.S.A. KENTUCKY. Nelson County: 2 miles N of Trappist Monastery, 13 & 31 May 1941, *M. E. Wharton 6003* (MICH) CH, C. – MARYLAND. Montgomery County: ca. 3 meters E of Lock 20 of the Chesapeake and Ohio Canal, *N. L. Gil-ad 226* (MICH) C, S. – MASSACHUSETTS. Berkshire County: ca. 0.2 miles S of Great Barrington town boundary, NW of Route 7, 22 May 1990, *N. L. Gil-ad 303* (MICH) S. – OHIO. Seneca County: T2, R15, Sec. 6, NE¹/₄, 3.5 miles N of Heidelberg College, 12 May 1963, *R. K. Scaife s.n.* (MICH) CH. – VERMONT. Addison County: Middlebury, 12 June 1902, *E. Brainerd 51b* (MICH) CL.

Additional specimens examined (putative hybrids): ILLINOIS. [Kendall County:] Yorkville, collected by Miss Pollard, transplanted May 1909, 31 Aug. 1910, *Ex Horto E. Brainerd 160* (US) C, S. – KENTUCKY. Bullitt County: 3.4 miles W of the intersection of US Route 31E and KY Route 480, 2 April 1991, *N. L. Gil-ad 402* (MICH) CH, CUL: S. – MICHIGAN. Washtenaw County: Lima Township, T.2S., R.4E., Sec. 26, SW $\frac{1}{4}$, NW $\frac{1}{4}$, woods at the back of 989 Dancer Road, 2 May 1990, *N. L. Gil-ad 246*; along the southern bank of Mill Creek, 7 May 1990, *N. L. Gil-ad 260* (MICH) CH, CUL: S. – NEW YORK. Onondage-Cortland county line, 2.4 miles SE of the intersection of routes 81 and 80, in woods NW of Labrador Hollow Wetland Boardwalk, 23 May 1990, *N. L. Gil-ad 306* (MICH) CH, CUL: S. – PENNSYLVANIA. Bradford County: Smithfield Township, 2.2 miles S of the intersection of Springfield Road and Benwick Turnpike, 10 May 1990, *N. L. Gil-ad 268* (MICH) CH, CUL: S. Chester County: Kennett Square, N of a driveway leading to 540 N. Walnut Road, 11 May 1990, *N. L. Gil-ad 273* (MICH) CH, CUL: S. – TEXAS. Travis County: City of Austin, ca. 0.1 mile E of Route 360, south side of Barton Creek, 22 March 1991, *N. L. Gil-ad 392* (MICH) CH, CUL: S. – VERMONT. Addison County: 4.4 miles E of the intersection of VT Routes 22A and 73 in Orwell, 15 May 1990, *N. L. Gil-ad 284* (MICH) CH, CUL: S. Lamoille County: 6 miles S of the intersection of Lower Valley Road and Main Street in Cambridge, 17 May 1990, *N. L. Gil-ad 293* (MICH) CH, C, S.

Viola triloba Schwein.

U.S.A. MICHIGAN. Washtenaw County: Ann Arbor Township, T.2S., R.6 E., Sec. 12, E $\frac{1}{2}$, 0.7 mile NW of the intersection of Dixboro Road and Ford Road, 29 May 1990, *N. L. Gil-ad 310* (MICH) CH, CUL: S. – NORTH CAROLINA. Salem, [date of collection missing], *L. D. de Schweinitz s.n.* (holotype: PH!) CH, C (immature).

Additional specimens examined (putative hybrids): FLORIDA. Gadsden County: Town of Chattahoochee, Chattahoochee Nature Park, 5 March 1991: CHP, 14 May 1991: CUL, *N. L. Gil-ad 355* (MICH) CH/ CL, C, S. – INDIANA. Crawford County: 2 miles E of Marengo, in beech woods, *C. C. Deam 23479* (VT) CL, C, S. – MICHIGAN. Hillsdale County: Jefferson Township, Lost Nation State Game Area, T.7S., R.2W., Sec. 25, SE $\frac{1}{4}$, NE $\frac{1}{4}$, NW of the intersection of Pittsford Road and Skuse Road, 6 July 1990, *N. L. Gil-ad 344* (MICH) CH, CUL: S. Washtenaw County: Ann Arbor Township, T.2S., R.6E., Sec. 1, SW $\frac{1}{4}$, NE $\frac{1}{4}$, ca. 0.5 mile E of 4984 Earhart Road, 8 May 1990, *N. L. Gil-ad 262* (MICH) CUL: S; *Gil-ad 264* (MICH) CH. – TENNESSEE. Wilson County: 3.2 miles E of the intersection of U.S. Highway 231 and Cedar Forest Road, 18 April 1991: CHP, *N. L. Gil-ad 439* (MICH) CH, C/ S. – VERMONT. Addison County: Orwell, wooded ledge of limestone, 30 July 1905, *E. Brainerd 167* (US) CL, C, S. – VIRGINIA. Alexandria County: Lima Park, 5 Sep. 1908, *P. Dowell 5535* (VT) C, IMS.

Viola villosa Walter

U.S.A. FLORIDA. Gadsden County: Town of Chattahoochee, Chattahoochee Nature Park, 5 March 1991: CHP, 16 May 1991: CLP, *N. L. Gil-ad 353* (MICH) CH/CL C, S. Liberty County: Torreya State Park, end loop of FL Route 271 S of Gregory House, 8 March 1991: CHP, 8/16 May 1991: CUL, *N. L. Gil-ad 362* (MICH) CH/ CL, C, S. – NORTH CAROLINA. Onslow County: 40 miles S of New Bern, 25 April 1913, *House 5093* (VT) CL, C, S. – TEXAS. Traves County: Bastrop State Park, 3 miles NE of the intersection of TX Highway 71 and Loop 150S of Park Road 1A, 24 March 1991: CHP, 20 May 1991: CLP, *N. L. Gil-ad 395* (MICH) C/ CL, C, S. – VIRGINIA. Norfolk County: Gilmerton, 19 April 1913, *House 5079* (VT) CL, C, S.

Additional Specimens Examined and Cited in the Text: Putative Hybrids

MÉXICO. HIDALGO: Baranca below Trinidad Iron Works, 5500 feet, 2 June 1904, *C. G. Pringle 8864* (GH) C, S (1); (MEXU) C, IMS (1); (MO) C, IMS (1); (US) C, IMS. TAMAULIPAS. Municipio Gómez Farias, vicinity of Rancho del Cielo Biological Station, ca. 7 km WNW of Gómez Farias along logging road from Indian Springs to Agua Linda turnoff, 1400 m., 1 June 1989, *A. A. Reznicek 8459* (MICH) CL, C, IMM. U.S.A. FLORIDA. Gadsden County: Town of Chattahoochee, Chattahoochee Nature Park, 5 March 1991, *N. L. Gil-ad 354* (MICH) CH, S. Kentucky. Nelson County: 1.2 miles SE of the intersection of U.S. Route 31E and KY Route 46E, 2 April 1991: CHP, 16 May 1991: CLP, *N. L. Gil-ad 405* (MICH) CH/ C, CL, S. VIRGINIA. Lee County: 0.25 SE of a bridge connecting U.S. Route 58 and VA Road 664, 27 March 1991, *N. L. Gil-ad 401* (MICH) CH, S.

9.5 Appendix D

Representative Specimens of Names in *Viola* Subsection *Boreali-Americanae* Commonly Recognized as Orthospecies, but Hypothesized to Represent Hybrids or Introgessants in This Treatment

Viola chalcosperma Brainerd

FLORIDA. Jacksonville, March 1907, *E. K. Comstock s.n.*, 15 Oct. 1909: CUL, *E. Brainerd s.n.* (VT) C, S; Jacksonville, off Lackawana Avenue, 22 March 1914, *E. Brainerd s.n.* (VT) CH, C.

Viola esculenta Elliott ex Greene

FLORIDA. Jacksonville, transplanted April 1909, 30 Aug. 1910: CUL, *Ex Horto E. Brainerd s.n.* (VT) C, S; Jacksonville, along bayou in shade near Lincoln Park, 21 March 1909, *E. Brainerd s.n.* (VT) CH, C, S; Jacksonville, Highway Avenue, Bridge, 10 Sep. 1909, *Ex Horto* [from seeds] *E. Brainerd s.n.* (VT) CL, C, S. Jefferson County: T.4S., R.3E., Sec. 11, NE¹/₄, 1.6 mile N of the Jefferson-Taylor county line, N side shoulder of U.S. Route 98, 7 March 1991: CHP, 14/16 May 1991: CLP, *N. L. Gil-ad 357A & B* (MICH) CH/CL, C, S.

Viola floridana Brainerd

FLORIDA. Jacksonville: in moist woodland, 13 & 22 March 1907, *E. Brainerd 60* (US) CH; transplanted March 1909, 7 Sep. 1910, *E. Brainerd 61* (US) CL, C, S. Daytona (?): 16 Feb. 1911, *N. F. Flynn 318* (VT) CH, C; 17 Feb. 1911, *N. F. Flynn s.n.* (VT) CH.

Viola hirsutula Brainerd

MISSOURI. St. Clair County: Taberville Prairie, 1.8 miles S of the intersection of county roads B and H; ca. 141 meters east of County Road H, 9 April 1991, *N. L. Gil-ad 420* (MICH) CH, CUL: S. – TENNESSEE. Sevier County: 2.5 miles SE of the intersection of U.S. Route 441 and Little River Road, 27 March 1991, *N. L. Gil-ad 398* (MICH) CH/CUL: S. – VIRGINIA. Wythe County: Jefferson National Forest, Stony Fork campground, south side of VA Highway 601, 4 miles W of the intersection with I-75, ca. 7 miles N of Wytheville, 28 May 1992, *A. A. Reznicek s.n.* (MICH) CH/CUL: C, S.

Viola lovelliana Brainerd

LOUISIANA. Crowley: hillocks under young pines, 25 March 1910, *E. Brainerd 77* (US) CH, C; transplanted March 1908, 11 Sep. 1909, *Ex Horto E. Brainerd 78* (VT, US) CL, C, S; transplanted Feb. 1911, 28 Aug. 1911, *Ex Horto E. Brainerd s.n.* (VT) CL, C, S; St. Tammany Parish: Fountainebleau State Park, 0.7 miles S of the intersection of the access road to Group Camp III Lodge and U.S. 190, 13 March 1991: CHP, 16 May 1991: CLP, *N. L. Gil-ad 375* (MICH) CH/CUL: CL, C, S; Vermilion Parish: 5.4 miles N of the intersection of LA Route 13 and I-10, 17 March 1991, *N. L. Gil-ad 380* (MICH) CH, S.

Viola palmata L.

NEW JERSEY. Burlington County: Mount Laurel Township, 1.5 miles SW of the intersection of NJ Route 38 and Briggs Road, and 0.3 miles S of the intersection of Walton Avenue and Union Mill Road, 29 April 1991, *N. L. Gil-ad 462* (MICH) CH, CUL: S; Sussex County: High Point State Park, 1.4 miles NE of the intersection of NJ Route 23 and Kuser Road, 0.5 miles NE of the intersection of Scenic Drive and Monument Drive, 12 May 1990, *N. L. Gil-ad 280* (MICH) CH, CUL: S. – MICHIGAN. Washtenaw County: Lima Township, T.2S., R.4E., Sec. 26, SW¹/₄, NW¹/₄, S of Mill Creek, 7 May 1990, *N. L. Gil-ad 258* (MICH) CH, CUL: S.

***Viola papilionacea* Pursh**

CONNECTICUT. Glastonbury, transplanted by C. H. Bissell, 18 May 1902, 20 Sep. 1903, *Ex Horto E. Brainerd s.n.* (VT) CH, C, IMS. – ILLINOIS. Yorkville, transplanted May 1909, 9 Sep. 1910, *Ex Horto E. Brainerd 107* (VT) CL, C, S. – INDIANA. Washington County: ca. 6 miles SW of Salem, wooded flood plain of Mill Creek, 6 June 1917, *C. C. Deam 23497* (VT) C, S. – MASSACHUSETTS. Brookline, dooryard, 25 Sep. 1905, *F. F. Forbes s.n.* (VT) CH, C, S; Brookline, corner of Freeman and Powell streets, collected by F. F. Forbes, May 1906, 31 Aug. 1906, *Ex Herb. E. Brainerd s.n.* (VT) CL, C, S; Cambridge, transplanted from Mr. Brewster's garden, May 1909, 21 Sep. 1910, *Ex Horto E. Brainerd 108* (VT) CL, C, IMS. – VIRGINIA. Lee County: 0.25 mile SE of a stone bridge connecting U.S. Route 58 and VA Route 664, NW of Jonesville, 27 March 1991, *N. L. Gil-ad 401* (MICH) CH, C, S.

***Viola pratincola* Greene**

IOWA. Page County: Plamquist Prairie, one mile west and 0.25 mile N of Bethesda, 12 May 1992, *B. L. Wilson s.n.* (MICH) CH, CUL: S; Johnson County: Williams Prairie, S of Williams cemetery along a gravel road, T.80N., R.8W., 17 May 1992, *B. L. Wilson s.n.* (MICH) CH. MINNESOTA. Near Windom, 1 July 1898, *E. L. Greene s.n.* (holotype: NDG!) CL, C, S. WISCONSIN. Prairie du Chien, 24 June 1898, *E. L. Greene s.n.* (NDG) C, S. Additional hybrid examined: IOWA. Page County: Palmquist Prairie, one mile west and 0.25 mile north of Bethesda, 12 May 1992, *B. L. Wilson s.n.* (MICH) S.

***Viola stoneana* House**

DISTRICT OF COLUMBIA: Brookland, May 1907, Collector Holm, *Ex Horto E. Brainerd 163* (VT) CL, C, S. – NORTH CAROLINA. Nash County: 2.5 miles S of the intersection of U.S. Route 64 Alt. and NC Route 581S in Spring Hope, west bank of the Tar River, 22 April 1991, *N. L. Gil-ad 450* (MICH) CH, C/ CUL: CH, S.

***Viola subsinuata* Greene**

TENNESSEE. Cocke County: within three miles of Wolf Creek Station, 11 Sep. 1897, *T. H. Kearney, Jr. 615* (holotype: NDG!) CH.

***Viola triloba* var. *dilatata* (Elliott) Brainerd**

ARKANSAS. Hempstead County: Fulton, 14 April 1905, *B. F. Bush 2313* (VT) CL, C, IMS. – MISSOURI. Christian County: Chadwick, 31 miles N of the Missouri-Arkansas border, 14 May 1907, *B. F. Bush 4435* (VT) CH, C, IMS. Dallas County: 11.9 miles E of the intersection of Missouri Route 73 and Missouri Route 64, T.35N., R.18W., Sec. 26, N¹/₂, 10 April 1991, *N. L. Gil-ad 424* (MICH) CH, CL, C, S; 12 miles E of the intersection of Missouri Routes 73 and 64, S of Route 64, 10 April 1991, *N. L. Gil-ad 425* (MICH) CH, IMS. Iron County: 4.6 miles S of the intersection of Routes 21 and 72 in Arcadia, 7 April 1991, *N. L. Gil-ad 411* (MICH) CH, CL, C, S; Bufford Mountain, 0.6 miles NE of the intersection of County Road U and Buford Mountain gravel road, 7 April 1991, *N. L. Gil-ad 412* (MICH) CH, CL, C, IMS.

***Viola viarum* Pollard**

IOWA. Montgomery County: T.12N., R.39W., Sec. 19, SW quarter, prairie between H34 and a railroad, 7 April 1992, *B. L. Wilson s.n.* (MICH) CUL: C, S. – MISSOURI. Eagle Rock, 10 June 1910, collector B.F. Bush, *Ex Horto E. Brainerd 176* (VT) C, S; Seedling from *Bush 3144*, 16 & 19 May 1911: CHP, 7 Oct. 1906: C, *Ex Horto E. Brainerd s.n.* (VT) CH, C, S; Pettis County: 2.7 miles W of the intersection of U.S. Route 50 and County Road T in Dresden, 8 April 1991, *N. L. Gil-ad 415* (MICH) CH, S.

Additional putative hybrids cited in the discussion on *Viola viarum*:

MISSOURI. Pettis County: 2.7 miles W of the intersection of U.S. Route 50 and County Route T in Dresden, 8 April 1991, *N. L. Gil-ad 416A-H & 417* (MICH) CH.