

The Native Orchid Conference Journal



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A Social History of North American Slipper Orchids Part 4

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CYPRIPEDIUM GUTTATUM SW., KONGL. VETENSK. ACAD. NYA HANDL. 21: 251 (1800).

Guttatum is Latin meaning spotted, referring to the large splotches of magenta on its lip.

This species was published by Linnaeus in *Species Plantarum* as *Cypripedium calceolus* var. δ (delta). He based this variety on Siberian specimens sent him by J. G. Gmelin and the description, *Calceolus foliis ovatis binis* appearing in Volume 1 of Gmelin's 1747 *Flora Sibirica sive Historia Plantarum Siberiae*. Linnaeus also refers to Johan Amman's 1739 *Stirpium rariorum in Imperio Rutheno* (Ukraine). Amman's work uses the polynomial, *Calceolus minor, florio vario*, and includes a good illustration.

Johann Georg Gmelin (1709-1755) was a member of the Royal Academy of Sciences in St. Petersburg. Early in his career he led a natural history exploration into Siberia, which lasted nine years. It was on this expedition that he collected this plant. Gmelin was also responsible for attracting Johann Amman (1707-1741), a Swiss-born naturalist, to St. Petersburg. Amman also became professor of botany at the Royal Academy. Both men maintained active correspondence with Linnaeus (Jarvis 2009).

Since Linnaeus did not give this taxon a specific epithet, the naming authority is Olof Swartz, M.D. (1760-1818), who applied the epithet *guttatum*.

Swartz studied under Carolus Linnaeus' son at the University of Upsala, concentrating on medicine and natural history. While there he botanized throughout Sweden. Immediately upon graduation, he travelled widely, spending a year in North America, then travelled on to the West Indies and South America, amassing a large collection of plants. Before returning home Swartz studied collections in various European herbaria. The rest of his life was devoted to botany and his special love, the *Orchidaceae*.

Cypripedium guttatum has the widest distribution of slipper orchids found in North America, (World Checklist of Monocotyledons 2009), ranging from Russia, south to Korea and eastward through Siberia, across the Aleutians into Alaska and Yukon Territory (Sheviak 2002). It is one of two slipper orchids found in North America that were first described from collections in Asia – the other being *C. yatabeanum*.

***CYPRIPEDIUM CANDIDUM* MUHL. EX WILLD., SP. PL. 4: 142 (1805).**

Candidum is Latin meaning snow-white, describing this species' lip.

Carl Ludwig Willdenow (1765-1812) published the accepted name in the fourth edition of *Species Plantarum*, (1805), which he edited. He indicated that his publication of this species was based on descriptions provided by Gotthilf Heinrich Ernst Muhlenberg (1711-1787), known as Henry.

Henry Muhlenberg was born and raised just north of Valley Forge, PA. He attended Halle University in Germany, studied botany, became a Lutheran minister, returned to the United States, and took a pulpit in Lancaster, PA. In addition to his church duties and botanical collecting, Muhlenberg was a founder of Franklin & Marshall College.

During his many years of avid collecting, he sent specimens and descriptions to Europe, many to Willdenow, for publication. Eight years after Willdenow's publication Muhlenberg published an extensive catalog of North American plants (Muhlenberg 1813) in which he noted that *Cypripedium candidum* was found in Pennsylvania, blooming in May.

Muhlenberg's big-hearted personality shows in the preface of his book, where after thanking a long list of "my American Friends and Correspondents who have generously assisted me by communicating Specimens or Seeds," he makes the following statement:

"HEALTH AND PROSPERITY TO THEM AND ALL LOVERS OF BOTANY!"

Carl Willdenow was taught to be an apothecary by his father and then attended medical school at Halle University. Later he became professor of botany at the University of Berlin and Director of the Berlin Botanical Garden. His interest was the relationship of climate and geography and plants, and he published extensively. Over a thirty-year period (1798-1826) he edited an expanded edition of Linnaeus' *Species Plantarum* in six volumes, where this species is described (Linnaeus 1805).

CYPRIPEDIUM ARIETINUM R.BR. IN W.T.AITON, HORTUS KEW. 5: 222 (1813).

Arietinum is Latin “referring to the fancied resemblance of the flower to the head of a ram complete with horns” (Luer 1975).

Twenty-four years after *Hortus Kewensis* appeared, William Aiton (see *C. acaule* above) had died and his son William Townsend Aiton (1766-1849) was in charge of the royal gardens at Kew, as well as Buckingham and Kensington Palaces. He also supervised an enlarged second edition to his father’s *Hortus Kewensis*. In the second edition (Aiton 1813) Robert Brown (1773-1858) wrote up the section on *Cypripedium*, thus his credit in the citation.

Son of a Scottish Episcopal minister, Robert Brown began his university training in medicine; however, he was more interested in botany. After dropping out of the University of Edinburgh, Brown served five years in the army and then signed on as naturalist on a surveying voyage to Australia. Returning to England he wrote up nearly four thousand plants, almost all new to science. He also made groundbreaking botanical discoveries using the microscope, including being the first to note the existence of the cell nucleus, while studying the microscopic structure of orchids.

Eventually Brown became librarian to Sir Joseph Banks, president of the Royal Society and the most prominent botanical scientist of his day. Banks bequeathed his extensive herbarium and library to Brown, who, in turn turned them over to the British Museum. With his position with Banks and later as keeper of the British Museum collection, Brown had access to botanical resources worldwide.

Noting that ram’s-head lady’s slipper is native to North America, Brown states that the species was introduced to Kew Gardens in 1808 by Messrs. Chandler and Buckingham, proprietors of a nursery in Vauxhall.

This is the second of our lady’s slippers to have a “sister” species in Asia (see *C. reginae* in previous volume of this journal, 8(2), p 1). As Luer describes it, “an analogous species, *C. plectrochilon*, reported by some authors as synonymous with *C. arietinum*, occurs in the mountains of southeastern China (Luer 1975).” Although difficult to distinguish on herbarium sheets, live specimens are clearly distinct.

One feature has caused considerable discussion – the totally free lateral sepals. In other *Cypripedium* species lateral sepals are partially joined into a synsepal. Free lateral sepals have been considered a primitive trait and some investiga-

tors segregated the two ram's head lady's slippers, *C. plectrochilon* and *C. arietinum*, into a separate genus, *Criosanthes*. The first to propose this genus was C. S. Rafinesque: "*Cypripedium arietinum* must form a peculiar genus, which may be called *Criosanthes borealis* (Rafinesque 1818)." This concept was not widely adopted. In 1984 Atwood suggested resurrecting Rafinesque's genus for these two species (Atwood 1984b); however, this position is rejected by most botanists, and recent study of genetic variations in North American slipper orchids validate maintaining this species within *Cypripedium* (Case, 1994).

CYPRIPEDIUM PASSERINUM RICHARDSON, BOT. APP., ED. 2: 34 (1823).

Passerinum is a Latinized word describing the lip as sparrow egg-like.

Sir John Richardson (1787-1865) started medical school at the University of Edinburgh at the age of fourteen. In our days such an accomplishment is reserved for geniuses; however, in the eighteenth and early nineteenth centuries, this was the norm. His study of natural history and botany in medical school was also a common practice in those days. On graduation, he volunteered as a Naval surgeon and traveled with Sir John Franklin on successive expeditions to Canada attempting to discover a northern navigable route to the Pacific. Although the primary mission of the expeditions failed, Richardson's natural history discoveries filled two books with his botanical, zoological and geographic discoveries. He published this orchid in his Botanical Appendix to Captain Franklin's Narrative of a Journey to the Shores of the Polar Sea, where Richardson gave this species the popular name Franklin's lady's slipper, honoring his captain.

The northern passage was considered so important to facilitate trade that many further expeditions were mounted, none of which were successful. Finding this passage was deemed so vital to the interests of Great Britain that twenty-two years after this species was named, Captain Franklin was persuaded to come out of retirement, and at the age of sixty he set out again to find the passage. Franklin's two ships and 128 crewmembers were never heard from again. He and all the crew starved and froze to death.

CYPRIPEDIUM MONTANUM DOUGLAS EX LINDL., GEN. SP. ORCHID. PL.: 528 (1840).

Montanum is Latin for living in the mountains, the location where the species was first found.

David Douglas (1798-1834) quit school at age eleven and began work as a gardener in his native Scotland, where his extraordinary accomplishments brought him to the attention of members of the Royal Horticultural Society of London. His connections and skills landed him a job as collector of North American plants for the society, and he was sent to the United States. After a year of studying with various naturalists on the east coast, including looking at the collections of Lewis and Clark, Douglas was sent to the west coast.

The Lewis and Clark expedition had seen *Cypripedium montanum* in Montana in June, 1806. A few days later, Lewis noted in his journal, "I also met with the plant in blume which is sometimes called the lady's slipper or mockerson flower." The plant was also described as having a smaller pouch than the eastern lady's slipper and had, "Small veigns of pale red longitudinally on the inner Side (Earle 2003)." Unfortunately, Lewis did not collect a specimen. It was left to David Douglas, on his trip in the mid 1820s, to collect a specimen and send it back to England, where Lindley published it in 1840.

John Lindley (1799-1865), the assistant Secretary of the Royal Horticultural Society, was responsible for Douglas' mission. He received all the collections and descriptions sent back by Douglas and published them; many were new to science, including *Cypripedium montanum*. The citation indicates that Lindley's publication of this species was based on the information provided by Douglas.

Lindley was the son of an English nurseryman who became a brilliant botanist and a prolific author. He became convinced that Linnaeus' artificial system of arranging plants was inferior to a natural system. Although many of his books were groundbreaking, his most important contribution to the study of orchids was *The Genera and Species of Orchidaceous Plants* (Lindley 1840), which earned him the title modern father of orchidology.

***CYPRIPEDIUM CALIFORNICUM* A. GRAY, PROC. AMER. ACAD. ARTS 7:389(1868).**

Californicum is the Latinized word denoting the location of the original collection and description.

Asa Gray (1810-1888), a New York native, helped American botany achieve world class, no longer dependent on the experts from Europe. His writings were many and thorough, and when he became professor of botany at Harvard, Gray transformed its resources to achieve international distinction. His personal herbarium and library were world class and in 1864 were donated to the university. Gray's *Manual of Botany of the Northern United States*, was con-

sidered the definitive authority through many revisions for over a century. Today the Harvard herbarium contains two million specimens, one of the largest in the U.S.

Gray was a great friend of Charles Darwin, and the two men corresponded for decades. He was an enthusiastic supporter of Darwin's theory of evolution, and given Gray's stature in the scientific community, this support blunted much of the criticism and upheaval that accompanied the publication of Darwin's theory in England.

With Gray's reputation and Harvard a recognized center of botanical knowledge, new generations of field botanists would send him their specimens for publication. No longer would native North American orchid species be sent abroad for publication.

The California lady's slipper was collected by Henry Bolander (1831-1897). Born in Germany and emigrating to the United States as a teenager, Bolander graduated as a Lutheran minister, but never practiced that profession. He became a teacher, and influenced by a neighbor, became interested in botany. After moving to San Francisco and teaching for years, he became State Botanist for the California Geologic Survey. It was during extensive survey expeditions that he collected many new species, including *Cypripedium californicum*. Bolander wrote few articles; he sent many of his specimens to Asa Gray, who eventually published the findings. Gray's habit was to collect groups of specimens and submit them for publications in large installments. For instance in the sixty-two page article that includes the description of *C. californicum*, Gray names over two hundred new species, and more than a few new genera, all with Latin descriptives, and most collected by Bolander (Gray 1868). Gray and other distinguished botanists who published Bolander's specimens named nearly forty species and one genus in his honor.

Cypripedium californicum has the smallest range of our slipper orchid species and is the only one with an elongated raceme of up to twenty flowers (observed on a field trip during the 2006 NOC annual meeting in Ashland, OR).

***CYPRIPEDIUM FASCICULATUM* KELLOGG, PACIFIC RURAL PRESS. 1879: 354 (1879).**

Fasciculatum is Latin for bouquet, or bundle, in recognition of the clustered raceme of flowers characteristic of the species.

Albert Kellogg (1813-1887), born in New England, moved south due to medical problems. He became a physician, but his overwhelming curiosity about natural history, especially botany, prompted him to move around quite a bit.

Eventually Kellogg's devotion to botanical exploration and neglect of his medical practice led to his abandoning medicine altogether. The turning point for Kellogg was meeting John James Audubon; they found themselves compatible and travelled extensively together. Eventually Kellogg, by then somewhat famous as a traveler and naturalist, was asked to join a group going to California.

Dr. Kellogg found much new material in his adopted state and threw himself into botanizing with zeal and eventually published over two hundred new species. He also sent many specimens to Sereno Watson at Harvard.

Sereno Watson (1826-1886) was another New Englander drawn to California. Not academically trained but attracted to botany, he joined a geological expedition and so thoroughly impressed its leaders with his meticulous attention to detail that he was appointed botanist when the original expedition botanist left because of illness. Watson wrote the botanical report of the expedition and it was so well done that Asa Gray offered him a position at Harvard. Watson eventually co-authored *Botany of California*, and took over many of the duties at the herbarium, leaving Gray free to pursue other projects. As with Gray, many outlying botanists would send specimens and descriptions to Harvard, and Watson took over the responsibility of publishing groups of them from time to time. As an example, the article in which he published *Cypripedium fasciculatum* (Watson 1882) contained 67 pages of plants, averaging four plants to a page. As a result of this publication, the naming authority until very recently was: *Cypripedium fasciculatum* Kellogg ex S. Watson, Proc. Amer. Acad. Arts 17: 380 (1882).

In Watson's description he credits Kellogg and states the specimen is in the herbarium. However, in researching this article, I found a reference to an article where Kellogg published a very thorough description of this species three years earlier (Kellogg 1879). After finding and submitting this earlier article to authorities, the naming authority has been changed to give Kellogg full credit.

It is interesting that Watson would publish this species three years after Kellogg had done so. Kellogg's description is more accurate and thorough, and typical of earlier botanical writing, he adds literary flourishes to technical description, for instance, "This charming suitress of the Pacific has a terminal cluster of flowers... modestly turned to one side and somewhat nodding"

***CYPRIPEDIUM YATABEANUM* MAKINO, BOT. MAG. (TOKYO) 13:91 (1899).**

Yatabeanum is a Latinized name honoring Ruyokichi Yatabe, who collected the specimen that Makino described.

Tomitaro Makino (1862-1957), son of a sake brewer, dropped out of school early, but devoted his life to botany and became knowledgeable in geology and fluent in English. Known as the father of Japanese botany, he wrote the definitive text on the Flora of Japan, described over a thousand new species and fifteen hundred new varieties. His collection of 400,000 specimens was donated on his death to the University of Tokyo. The description of this species, said to be typical of Makino's meticulous nature, is 725 words long (Makino 1899). Compare this to Walter's eleven word description of *Cypripedium reginae*!

The namesake of this species, Riokichi Yatabe, was an early twentieth century Japanese botanist. Yatabe was the first Japanese to graduate from Cornell University. Afterwards he returned home where he became curator of the Tokyo Botanic garden and eventually assumed the post of principal of the Tokyo Imperial University.

This is the second slipper orchid – the other being *C. guttatum* – that is at the easternmost edge of its range here in North America. Because of its very limited geographical range in North America, its similarity to *C. guttatum*, and the unfamiliarity of the nominate species on the part of North American botanists, its treatment has varied in our literature. His original publication does not indicate the range of the species; he merely cites two collections.

Correll recognizes *C. yatabeanum* as a synonym for *C. guttatum* (Correll 1950), whereas Hultén conceives of *C. guttatum* having two subspecies – subsp. *guttatum* and subsp. *Yatabeanum* (sic). He indicates that the subspecies exists only on the outermost of the Aleutian chain, while a “range of forms more or less intermediate between” ... the two subspecies exist eastward through the Aleutians, Kodiak and the southwestern coast of Alaska (Hultén 1968). Luer recognizes *C. yatabeanum* as one of two varieties of *C. guttatum*. While stating, “In the Aleutian Islands the two varieties apparently hybridize,” Luer maintains that var. *yatabeanum* can be found in the Aleutians and, “On Kodiak Island we saw this variety growing in cold, wet, wind-swept meadows. (Luer 1975)”. Cribb maintains *C. yatabeanum* as a full species citing “its distinct geographic distribution and lack of any obvious hybrids in herbarium collections I have examined”. He claims it is found in the Aleutians, Kodiak and the southwestern peninsula of Alaska (Cribb 1997). In the Flora of North America, Sheviak makes the point that in Asia and Japan the species is distinct and easily distinguishable from *C. guttatum*; however, plants throughout the Aleutians (with rare exceptions), Kodiak Island and southwestern Alaska that have been labeled in the past as *C. yatabeanum*, are of hybrid origin (Sheviak 2002). The conclusion is that while there may be a few plants scattered in the far Aleutian Islands that are referable to the nominate species, the remaining plants show a great range of introgression.

***CYPRIPEDIUM KENTUCKIENSE* C.F.REED, PHYTOLOGIA. 48:426 (1981).**

Kentuckiense is a Latinized place name – for the state where the author first collected the species.

Clyde Franklin Reed (1918–1999) was a botanist with wide interests. After attaining his doctorate at Harvard, he worked as a food chemist, taught biology at five colleges and universities and worked at the US Department of Agriculture and The Smithsonian Institution. He also wrote books on herpetology, weeds and agronomics. In addition Reed amassed an herbarium of 500,000 specimens, over 50,000 of which were from Kentucky (Reed 1982).

While teaching in Kentucky in 1948 he was shown a wild collected white lady’s slipper in a garden. His students reported seeing it in two other counties, where he collected specimens. These early specimens remained unmounted for decades until he had time to finish his backlog of samples. Then, finding nothing in Luer’s treatise (Luer 1975) that matched his discovery, Reed published his finding as a new species (Reed 1981).

It boggles the mind that such an orchid, the largest and most striking of all the slipper orchids of North America, was not recognized and described sooner. A complete narrative of this taxon’s history can be found in recent articles (Soukup 1977, Atwood 1984, Brown 1995); it is too long and complex to fully explore here, so I will summarize.

The earliest person to describe a plant that seems to match the present concept of *Cypripedium kentuckiense* was Constantine Samuel Rafinesque (1783-1840) in his treatise, *Medical Flora; or Manual of the Medical Botany of the United States of North America* (Rafinesque 1828), where he recognizes all yellow-flowered North American slipper orchids as one species, *Cypripedium luteum*, encompassing eight varieties. Later he called the large-flowered form *Cypripedium furcatum* (Rafinesque 1833, Wilson 1982). The problems with these names are twofold: there are no type specimens and the descriptions in both instances are not definitive; therefore, neither can be used to differentiate our concept of *Cypripedium kentuckiense* from the remaining yellow slipper orchids.

Norman Yarian was the first to publish a photograph of *Cypripedium kentuckiense* (Yarian 1939). Unfortunately Oakes Ames determined the dried specimen submitted to him to be *C. parviflorum* var. *pubescens*; and that is how it was labeled in Yarian’s article.

Donovan Correll (1908-1983) considered all yellow lady's slippers as polymorphic varieties of *C. calceolus* (Correll 1950). Carlyle Luer also considered all yellow lady's slippers to be varieties of the same species (Luer 1975).

There is another twist in the story. In the early 1950s an Ohio plant enthusiast and fisherman, Jim Daulton, found a huge slipper orchid while on a fishing trip to Kentucky. He brought it home, where it thrived in his yard. One person who was intrigued by the plant, Dr. Victor Soukup, took up the challenge of studying it. Working out of the University of Cincinnati herbarium for over four decades, Dr. Soukup is known especially for his extensive work with Trilliums. After seeing Daulton's plant and locating colonies in Kentucky and years of study, Soukup was convinced it deserved species status and published the plant as *Cypripedium daultonii*, honoring Jim Daulton (Soukup 1977). Unfortunately Dr. Soukup did not designate a type specimen nor did he provide a Latin diagnosis (differentiating description), both of which are required to receive official recognition (Atwood 1984a).

As a result of these two missing pieces of information, Soukup's name is deemed illegitimate. Reliable sources indicate a darker side to this story. According to these accounts, Reed visited the University of Cincinnati herbarium where Soukup and a colleague were working on an expanded, valid publication of this species. It was only after learning about Soukup's renewed work did Reed rush to publish the species in his own journal, *Phytologia*.

Enzyme studies (Case 1998) and morphological analysis (Weldy 1996) substantiate species status for this taxon. According to Atwood (Atwood 1985) *Cypripedium kentuckiense* is apparently the largest flowered *Cypripedium* in the world.

(Article to be continued in future installments.)

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(Continued on page 19)

Figures to accompany “The Identity and Occurrence of *Platanthera convallariifolia* in North America” by Charles Sheviak, page 21

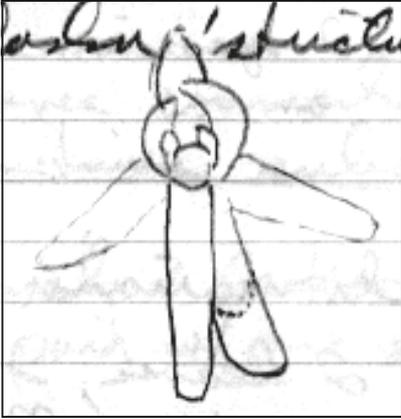


Figure 1. Rough sketch by the author of a typical flower of *Platanthera convallariifolia* examined in the herbarium at Vladivostok [VLA]. Dotted line indicates variable spur length. Note broad column with widely-space, parallel anther sacs flanking the mouth of the spur. Reference to *P. stricta* is from my notes noting some similarity to that species.



Figure 2. Type of *P. convallariifolia* in the Lindley herbarium at Kew [K]. The enlarged flower [insert] is from the central specimen, *i.e.*, the lectotype.

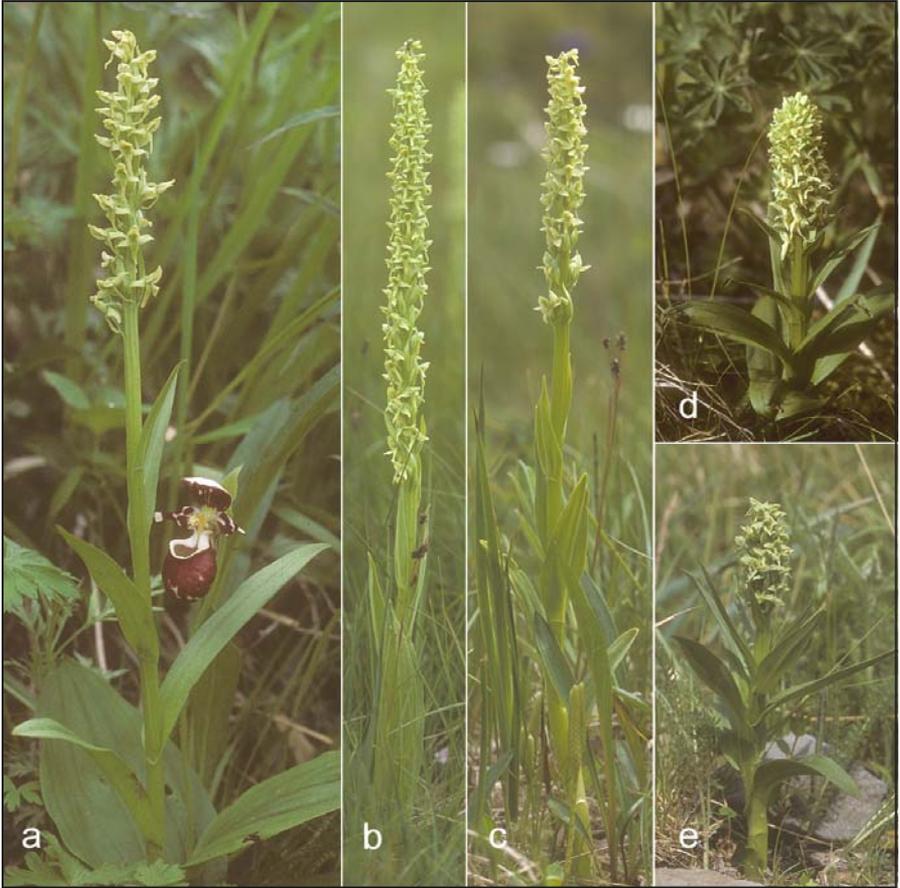


Figure 3. *Platanthera convallariifolia* in the field on Unalaska, Aleutian Islands showing variability in vegetative habit resulting from differences in exposure and soil moisture. All specimens deposited at NYS. a: Sheviak & Sheviak 6419 (with *Cypripedium* *×alaskanum*, Sheviak & Sheviak 6416); b: Sheviak & Sheviak 6407; c: Sheviak & Sheviak 6407a; d: Sheviak & Sheviak 6422; e: Sheviak & Sheviak 6432.



Figure 4. *Platanthera convallariifolia* showing variation in floral morphology on Unalaska Island. c and f photographed in the field and subsequently preserved and deposited at NYS. All others photographed under uniform cultivation in years following collection and preservation of original field-grown inflorescences deposited at NYS. a: Sheviak & Sheviak 6419d; b: Sheviak & Sheviak 6419b; c: Sheviak & Sheviak 6407/1; d: Sheviak & Sheviak 6407d; e: Sheviak & Sheviak 6419c; f: Sheviak & Sheviak 6407/2; g: Sheviak & Sheviak 6419a; h: Sheviak & Sheviak 6407b; i: Sheviak & Sheviak 6407e.



Figure 5. Unalaska Island, Aleutian Islands. *Platanthera convallariifolia* occurs commonly and widely from upper, drier slopes to low fen-like seeping meadows. In the latter sites it occurs with *P. dilatata* and *P. stricta*.



Figure 6. *Platanthera convallariifolia* from Unalaska, in cultivation. Left: same plant as Sheviak & Sheviak 6419a; Right: same plant as Sheviak & Sheviak 6419d. Compare the plant on the left with the type in Figure 2. The plant on the right in particular illustrates the typical short, stiff leaves widely spaced and abruptly spreading from the stem, a vegetative habit that is shared with *P. stricta*.



Figure 7. *Platanthera huronensis* (left) from Popof Island, Shumagan Islands, and *Platanthera convallariifolia* (right) from Unalaska, Aleutian Islands, in cultivation showing floral differences under uniform growing conditions. Note especially the different columns. Left: Sheviak & Sheviak 6463a [NYS]; Right: Sheviak & Sheviak 6419d [NYS]

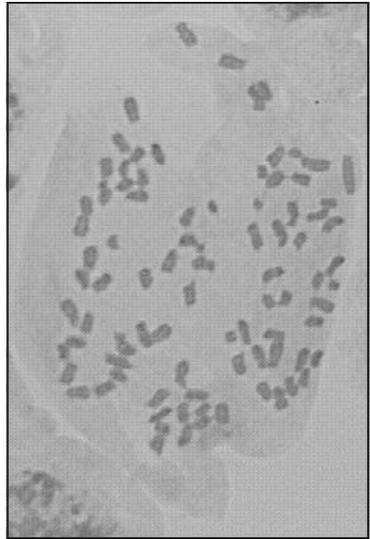


Figure 8. *Platanthera convallariifolia* from Unalaska. Sheviak & Sheviak 6407d [NYS]: ovule mitotic metaphase, $2n=84$.

Figures to accompany “A Wonderful Spring in North Carolina” by David McAdoo, page 26



Isotria medeoloides. Close-up



Isotria medeoloides



Isotria medeoloides. Seed pods.

(Continued from page 10)

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The Latest Names, Please

There have been many discussions (and will be) about the names of a native orchid species. Has anyone recently compiled a list that we might share with the readers? As a minimum it would include the current accepted name, previous name(s), and common name(s). Our intent is to facilitate communication around North American native orchids.

Please share your information and thoughts with the editor, Duane Erdmann, at djerdmann46@comcast.net.

The Identity and Occurrence of *Platanthera convallariifolia* in North America

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Platanthera convallariifolia Fisch. ex Lindl.¹ is one of the more misunderstood and ambiguously interpreted species in the so-called *P. dilatata-hyperborea* complex. Described from Kamchatka in 1835, it subsequently has received diverse treatments on both sides of the Pacific. Recognized at the species level in Flora of the USSR [as *Limnorchis convallariaefolius* (Fisch. ex Lindl.) Rydb.] (Nevski 1935.), in Japan the same plant has been treated as *Platanthera hyperborea* (L.) Lindl. var. *viridiflora* (Cham.) Kitamura (Kitamura and Murata 1966; Hashimoto, Kanada, and Murakawa 1991) or merely as *P. hyperborea* without formal varietal recognition (Maekawa 1971). In North America, although transferred at the species level to *Limnorchis* by Rydberg (1901), *P. convallariifolia* was treated in the synonymy of *P. dilatata* by Ames (1910) and Correll (1950) and of *P. hyperborea* by Luer (1975). Hultén (1968), with the most intimate familiarity with the flora in question, adopted *P. convallariifolia*, but he did not differentiate it from *P. huronensis*, a species not recognized at the time.

Study of specimens in the herbarium of the Institute of Biology and Soil Science, Vladivostok [VLA], suggested to me that they were similar to, yet distinct from, North American *P. huronensis* (Nutt.) Lindl. At the time of my study in 1994 this species was still poorly delimited; my work was still in a fairly early stage, and I had not yet even realized that the plant I was later to describe as *P. aquilonis* Sheviak was not *P. hyperborea*. Despite the rather vague concepts I was dealing with, the Asiatic plants nonetheless appeared quite distinctive even in the herbarium; unfortunately I did not encounter the species in the field.

¹ This species was originally described, and has long been known, as *Platanthera convallariaefolia*, an orthographic variant that the International Code of Botanical Nomenclature now requires be changed to *P. convallariifolia*. Whereas this mode of compound formation might be consistent, it is in contravention of established methods in both classical and botanical Latin, where a root ending in “i” is not to be followed by a second “i” as a connective. Indeed, in descriptive writing, the traditional mode is still employed. Hence, if the species were to be newly described today, one might write: “*Platanthera convallariifolia* spec. nov. *Herba erecta convallarifolia, flores virides....*” Don’t blame me, I didn’t write the rules.

Herbarium study showed flowers with rather long linear lips and variably shorter, somewhat clavate spurs (Figure 1; page 11). In a few specimens the lips were more lanceolate. In a general way, then, they seemed to combine characteristics of *P. stricta* Lindl., with its long linear lip and obtuse-clavate to saccate spur, and those of *P. huronensis* with lance-acuminate lip and longer, more slender spur. Viscidia were oblong as in *P. huronensis*, but the column appeared broader.

Vegetatively the plants were not remarkable, and the leaves were not notably broad as suggested by the name [*Convallaria* = lily-of-the-valley]. They were, however, often rather short and then suggestive of *P. stricta*. As noted by others, however, the name probably stemmed from a mixture of species in the type collection. Nevski (1935) reported that Fischer's collection included three specimens, one a *Platanthera* typical of the group, the others broad-leaved vegetative fragments of *Neolindleya camtschatica*. He evidently was describing material at a herbarium that was not consulted for the present study: The type sheet in the Lindley herbarium at Kew [K] also bears three specimens, but two are blooming plants of *P. convallariifolia*, and the third is not definitively determined (Figure 2; page 11). A duplicate from Lindley in the Torrey Herbarium at the New York Botanical Garden [NY] is a single blooming and entirely comparable *Platanthera*. It does not appear that anyone has definitively dealt with the nomenclatural problem represented by the mixture, and so here I designate the central, blooming specimen at Kew lectotype.

Platanthera convallariifolia has long been attributed to the Aleutians (Rydberg 1901). Hultén (1968) showed a continuous distribution along the chain and northeastward along the Alaska Peninsula, Kodiak Island, and the Kenai Peninsula. He also indicated a disjunct occurrence on the southern coast of the Seward Peninsula. My own herbarium studies suggest a more limited distribution in the Aleutians and on the Alaska Peninsula, with the species being replaced eastward by *P. huronensis*, a species not reported by Hultén. The two species are sympatric or parapatric in the easternmost Aleutians and to a limited extent eastward. I have not been able to account for Hultén's Seward Peninsula occurrence; the only herbarium specimens from the region that I have seen are those I referred to *P. hyperborea* in my previous paper (Sheviak 2011), and of *P. obtusata*, a species that Hultén also plotted from the area. The earliest of the *P. hyperborea* was collected several years after Hultén's report and could not have been the basis for it. These collections were furthermore made at an interior site; Hultén's locality appears to be in the vicinity of Nome, where I collected *P. hyperborea* (Sheviak *l.c.*). It is possible that his report is based on an earlier collection of that species that was not in the herbaria I consulted. Hultén did not recognize *P. huronensis*, and showed *P. hyperborea* ranging across the eastern half of the state; his concept of the latter species

probably included both *P. hyperborea* and *P. aquilonis*. By the time I reported *P. convallariifolia* in Flora of North America (Sheviak 2002), I had become convinced that the species ranged along the Aleutians and onto the Alaska Peninsula, but I had not seen it further east. In the field I had found only *P. huronensis* on the Kenai Peninsula, but I had not yet studied live plants in the Aleutians. My morphological description was correspondingly tentative. With subsequent field work in the Aleutians and the Shumagan Islands and with several years of experience with collected plants in cultivation, I now have a clearer concept of the species and need to refine my earlier characterization.

Plants of *P. convallariifolia* on Unalaska are highly variable in vegetative habit and floral morphology (Figures 3-4; pages 12-13). Occurring abundantly across wide moisture and exposure gradients (Figure 5; page 14), plants vary from tall and slender with ascending leaves and a habit typical of the group in lower fen-like sites, to short and stocky, with densely clustered leaves abruptly diverging from the stem in drier exposed upland meadows. Flowers vary, too, most noticeably in the shape of the lip, which varies from linear in taller plants of more sheltered, wetter sites, to commonly rather short and rounded, with a rounded basal dilation in stockier plants of more exposed, drier situations. To some extent this variability may be genetically fixed, as vegetative and lip characters remain somewhat variable in cultivation, but much of it is clearly phenotypic. Indeed, it was only after cultivating plants that the vegetative habit of the holotype developed (Figure 6; page 14).

Although variability in lip shape and vegetative habit may dominate first impressions and obscure the distinctions between *P. convallariifolia* and *P. huronensis*, the two species are quite distinct. Growth under moderate, uniform conditions in cultivation can foster the expression of innate phenotype and display the marked differences between the species (Figure 7; page 15). More significantly, under even variable field conditions column structure differs markedly between the two species. The connective is much broader in *P. convallariifolia* than in *P. huronensis*, with the anther sacs more widely spaced and essentially parallel. This provides a gaping aspect to the column of *P. convallariifolia* as it flanks the mouth of the spur, in contrast to that of *P. huronensis*, which appears rather to perch atop the opening. These different aspects reflect differences in rostellum development and positions of the viscidia, which in *P. convallariifolia* are oriented to the sides of the mouth of the spur and face somewhat inward; in *P. huronensis*, they are more toward its upper edge and directed downward. These differing orientations are expected to be significant in pollination, as they would result in different placements of pollinaria on the insect. They might thus serve to isolate the species to some extent by lessening the effectiveness of cross-pollination between the species if they were to grow in proximity.

Like *P. huronensis*, *P. convallariifolia* is tetraploid (Figure 8; page 15). As an allopolyploid derived through hybridization of *P. aquilonis* and *P. dilatata* (Catling & Catling 1997; Sheviak 1999; Wallace 2003), *P. huronensis* is variable and this variation can be difficult to interpret. The potential range of variation in this species must then be considered in delimiting *P. convallariifolia*. Might *P. convallariifolia* be merely an extreme form of *P. huronensis* resulting from a unique combination of parental genes? As mentioned previously (Sheviak 2002), lip, spur, and vegetative habit of *P. convallariifolia* suggests *P. stricta*, and that species may have had some ancestral role in its generation, either through hybridization with *P. huronensis* or possibly as party to an entirely independent amphiploid event. However, the large column with viscidia flanking the mouth of the spur is not a feature that would obviously be contributed by *P. stricta*, and some more obscure or complicated derivation may have been involved. The column is furthermore foreign to both *P. aquilonis* and *P. dilatata* and consequently is not likely derived from *P. huronensis* itself. In any case then, *P. convallariifolia* lies well outside the range of variation otherwise exhibited by *P. huronensis* and hence is appropriately treated as specifically distinct.

Platanthera convallariifolia ranges along the Aleutians and onto the Alaska Peninsula. At its eastern limit, it overlaps the western range limit of *P. huronensis*, which occurs in the Shumagan Islands and as far west as Tigalda Island, which is just to the northeast of Unalaska. Some of the variability exhibited by *P. convallariifolia* in this area may consequently be the result of introgression.

ACKNOWLEDGEMENTS

I am grateful for the support of the curators and staffs of the herbaria that provided loans for this study (ALA, UAAH) or facilitated my visits (AMES, GH, K, VLA). My own collections are deposited at NYS. Special thanks are due Stephen Talbot for his nearly annual contribution of collections spanning well over a decade and the length of the Aleutian chain, the Shumagan Islands, and the Alaska Peninsula.

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A Wonderful Spring in North Carolina

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This has been an exciting spring with some great orchid discoveries in North Carolina. The first came through an emailed photo. Out of the blue I got a request from a guy wanting help with an ID. It turns out that he had found a new location for *Calopogon multiflorus* in the Holly Shelter area along the North Carolina coast. That is only the second or third location for this rare species in the state and puts it close to its northern limit. As I sent the photo around to confirm my ID there were some excited folks. One of them is a new resident of Greensboro. Doug Goldman who did the *Calopogon* section of the Flora of North America has just moved here to join the USDA Plants organization that is being set up in the city. It is great to be able to access that organization's expertise.

The second round of excitement came from a location east of Greensboro. Several years ago a lady called a friend who does a short native plant column in a local Sunday paper. The caller said that she thought that she had found several plants of *Isotria medeoloides* in her back yard and wanted someone to confirm her find. Needless to say when we were told Mark Rose and I were in our cars the next day to see the plants!

It turned out that the plants were the Small Whorled Pogonia, and it is the second colony that has been discovered in someone's yard in North Carolina over the past 15 years. This is the first Piedmont location for the state. Most of the other NC populations are found in the mountains. Her colony consisted of three plants at the edge of the wood line in her back yard. Over the years the location has had mostly one plant and for the past several years the plant has had two flowers. This year there is only one plant again, but it has three flowers! I have been searching the internet for any other known triple flowering plants but have not been able to find any records for one. This plant got another round of people very excited also. (Figures on pages 16-18).

If these two finds are any indication of how the year will turn out, I can hardly wait to see what comes next. I hope that you too have great orchid hunting this season.

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Native Orchid Conference

at



Mt. CUBA
CENTER INC.

Saturday, July 30, 2011

- 7:45/8:00 AM Shuttles leave hotel
8:00-9:00 Registration and continental breakfast
9:00-9:30 Conference opening and welcome
9:30-10:30 **Orchids and Their Fungi—What Do We Know and What Do We Need to Know**
— Melissa McCormick
10:30-10:45 Break
10:45-11:45 **What Makes Wild Orchids Set Seed — Experiments on *Cypripedium acaule***
— Dr. Douglas Gill
Noon -1:00 PM Lunch, Vendors, Posters (Tent and Main House)
1:00-2:00 ***Calopogon tuberosus* X *Arethusa bulbosa* -Are There Natural Hybrids?**
— Robert Yannetti,
2:00-3:00 **Orchids of Delaware — William McAvoy**
3:00-3:15 Break
3:15-4:15 **Introduction to Mt. Cuba Center and Its Orchid Collection — Phil Oyerly**
4:15—7:00 Reception and tours of greenhouses and gardens
7:00 PM First shuttle leaves to return to hotel
7:15 Second shuttle leaves to return to hotel

Sunday, July 31, 2011

- 7:45/8:00 AM Shuttles leave hotel
8:00-9:00 Continental Breakfast
9:00-10:00 **The Arts and Crafts of Plant Propagation — Rob Griesbach**
10:00-11:00 **A Proposal for The NA Orchid Conservation Center — Dennis Whigham**
11:00-11:15 Break
11:15-12:15 **The Lure of the Pine Barrens — Ted Gordon**
12:30-1:30 PM Lunch, Vendors, Posters (Tent and Main House)
1:30-2:00 **NOC Business Meeting**
2:00-2:30 **Hazleton Bog — Conservation Work in Progress — Bob Sprague**
2:30-3:30 **Orchids of Israel — Hal Horwitz**
3:30—3:45 Break
3:45-4:45 **Floral Evolution in the North American *Platanthera*: Plant-Pollinator**
Interactions — Jeffrey Hapeman
4:45-5:15 Field trip info, conference surveys, closing
5:30 PM First shuttle leaves to return to hotel
5:45 Second shuttle leaves to return to hotel

Monday, August 1, and Tuesday, August 2

The Native Orchid Conference, Inc. will organize optional field trips, following the conference, to locations in New Jersey, Pennsylvania and Delaware where native orchids may be viewed. Directions to these locations will be distributed during the conference. Transportation is on your own. (see next page.)

Speaker Topics and Biographies – 2011 NOC

Douglas Gill: *What Makes Wild Orchids Set Seed-Experiments on *Cypripedium acaule**

Doug is a Professor Emeritus in the Dept. of Biology, University of Maryland. He has done research in many areas, including empirical and experimental studies of over 6,500 marked individuals of Pink Lady's-Slippers, *Cypripedium acaule*, in several natural stands.

Ted Gordon: *The Lure of the Pine Barrens*

Ted currently serves as chairman of the Governor's Natural Areas Council. A rare plants specialist, a photographer and Pinelands historian, Ted is the director of Pine Barrens Inventories, a prestigious environmental consulting and research firm based in Burlington County, New Jersey.

Rob Griesbach: *The Arts and Crafts of Plant Propagation*

Rob is currently the Deputy Assistant Administrator for Technology Transfer in the USDA's Agricultural Research Service (USDA-ARS). He helps to coordinate programs to optimize the transfer of research results across USDA-ARS to the private sector and other users for development and commercialization.

Jeffrey Hapeman: *Floral Evolution in the N. American *Platanthera* Plant-Pollinator Interactions.*

Jeff is currently the Chief Technology Officer at Wilshire Associates, a global investment technology firm. He holds an MS in Botany and Evolutionary Biology from the University of Wisconsin-Madison.

Hal Horowitz: *Orchids of Israel*

Hal is a retired pediatric dentist from Richmond, VA. He and his wife, Helen, have traveled extensively across North America photographing wildflowers, primarily wild orchids, for 20 years.

William McAvoy: *Orchids of Delaware*

Bill is the botanist for the Delaware Natural Heritage and Endangered Species Program. He has primary responsibility for planning, coordinating, and conducting inventories for rare plant species throughout the state of Delaware.

Melissa McCormick: *Orchids and Their Fungi—What Do We Know and What Do We Need To Know*

Melissa has been an Ecologist at the Smithsonian Environmental Research Center since 1999. She received a BS in Biology from Trinity University, San Antonio, TX and a PhD in Ecology, Evolutionary Biology and Behavior from Michigan State University.

Phil Oyerly: *Introduction to Mt. Cuba Center and Its Orchid Collection*

Phil is the greenhouse manager and has worked in the plant propagation area at Mt. Cuba Center for 33 years. Phil and his staff grow native plants in support of landscape and research activities at Mt. Cuba Center.

Bob Sprague: *Hazelton Bog—Conservation Work in Progress*

Bob is a former Navy Supply Corps officer and a retired business executive. His psychology degree from Muhlenberg College should help him control his OCOD (obsessive, compulsive orchid disorder) but, he is a Director of the Native Orchid Conference and the Southeastern Pennsylvania Orchid Society anyway. Bob and his wife Amy travel extensively in pursuit of orchids and birds.

Dennis Whigham: *A Proposal for the North American Orchid Conservation Center*

Dennis is a Senior Botanist at the Smithsonian Environmental Research Center in Edgewater, MD. His current projects focus on wetlands, the rarest terrestrial orchid in eastern North America, and invasive species.

Robert Yannetti: *Calopogon tuberosus X Arethusa bulbosa - Are There Natural Hybrids?*

Robert is a retired electronic engineer with a lifelong interest in the Pine Barrens of New Jersey. That interest narrowed over time to the terrestrial orchid *Arethusa bulbosa*. He has made and registered five intergeneric hybrids among *Arethusa bulbosa*, *Calopogon tuberosus*, *Eleocharis japonica* and the allied genus *Bletilla striata*.

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