

New England Botanical Club - Minutes of the 997th Meeting

7 May 2004

Jennifer Forman Orth, Recording Secretary

The 770th meeting of the New England Botanical Club, being the 997th since its original organization, was held on Friday, May 7, 2004, in the Education Building of the New England Wild Flower Society's Garden in the Woods, Framingham, MA. There were 66 members and guests in attendance.

Les Mehrhoff and Janet Sullivan began the meeting with the announcement of the recipients of the club's Fernald Award: Arthur C. Mathieson, Clinton J. Dawes, Larry G. Harris, and Edward J. Hehre, for their paper "Expansion of the Asiatic green alga *Codium fragile* subsp. *tomentosoides* in the Gulf of Maine." [Rhodora 105:1-53 (2003)]. Fernald Award Committee member Janet Sullivan noted that the article featured an excellent interdisciplinary collaboration on a timely topic.

President Art Gilman then introduced this year's Distinguished Speaker, Dr. Charles Sheviak, from the New York State Museum in Albany. His talk was titled "An Orchidological Odyssey: Systematics in a well-known group." Chuck, who discovered his interest in botany as a fourth grader hunting for bugs, has since spent many years ironing out the wrinkles in orchid taxonomy.

His first project, which focused on populations of *Spiranthes* in the Western U.S., set him off along a chain of new discoveries. Based on an old specimen from Great Basin, UT, he located plants in Colorado that turned out to be a new species, *S. diluvialis*, intermediate between *S. magnicamporum* (2n=30) and *S. romanzoffiana* (2n=44). *Spiranthes diluvialis* is an allopolyploid with a chromosome number of 2n=74, exactly the sum of the diploid genomes from each of its parents. He later found other plants in Arizona that looked similar to *S. magnicamporum*, but turned out to be a second new species, *S. delitescens*. While looking for *S. delitescens*, he checked out reports of *S. romanzoffiana* from desert wetlands in NV. The plants turned out to be another new species, *S. infernalis*.

Work with the genus *Spiranthes* led him to a second orchid genus, *Platanthera*. In NY he encountered populations of two different taxa of what he referred to as "BGPs," or Basic Green *Platanthera*, that were both marked as *P. hyperborea*, though they did not appear to match the description of that species. Further investigation showed that populations in the Eastern U.S. were allotetraploid (4n). They have since been reclassified as *P. huronensis*, which differs from other species in the genus by the higher positioning of the anthers, preventing auto-pollination. Remarkably, the eastern diploid plants were found to be from an undescribed species, now *P. aquilonis*.

Chuck has also spent a significant amount of time studying the genus *Cypripedium*, looking in particular for species that look similar to our native Lady's Slipper, but have unique flower coloration. He has found three varieties of *C. parviflorum* so far, but notes that there is still much to be resolved in the taxonomy of this species. The most widespread, var. *pubescens*, can be highly variable in shape and size, the result of both phenotypic and genotypic variation. A second variety, originally known as var. *parviflorum*, has since been renamed var. *makasin*. It can be recognized by its small-flowered plants, found in fens, that have a distinct, fruity scent. Chuck found that they were quite unlike the true var. *parviflorum*, a Southeastern species with a different floral spotting pattern and a faint, roselike scent. His favorite *Cypripedium* species is *C. montanum*, native to the Pacific Northwest. It hybridizes with *C. parviflorum* to form *C. x columbianum*. Molecular studies showed that there was gene flow between the two parent species in the distant past, but there is also currently hybridization occurring due to the habitat destruction caused by logging, which has permitted *C. parviflorum* to move into the more montane habitat of *C. montanum*.

Chuck's studies have taken him as far as Vladivostok, near the Pacific coast of Russia. There, he found *C. macranthos* and *C. calceolus* crossing to create a series of hybrids that show all of the characters of the North American *C. parviflorum* complex. This suggests that the origin of *C. parviflorum* could have been from an ancient hybridization event that took place in Asia. Chuck found a 1:1 correlation in morphology and color patterns between the Vladivostok hybrids and *C. parviflorum* var. *pubescens*; only the intensity of the coloration varied. The variation in *Cypripedium parviflorum* var. *pubescens* may be an expression of an ancient hybrid progenitor.

Chuck ended his talk with some beautiful images of *Platanthera leucophaea* (Eastern prairie fringed orchid), a very rare species. He collected specimens from Illinois and North Dakota, noting that the western plants had fewer but larger flowers. Growing them together, Chuck was surprised when the Illinois and North Dakota plants both flowered on the same day, allowing him to make a precise comparison. He noted that though the plants are both pollinated by sphingid moth species, their flowers are structured so that they each place their pollinarium on a different part of the moth. This ensures that there is no cross-pollination between the two flower types, an indication that the plants are in fact separate species. Chuck described the more western plants from the Missouri River drainage and northward as *P. praeclara*, the Western prairie fringed orchid.