

The Historical Introductions of Waterhyacinth and Hydrilla into the United States

by Don C. Schmitz

During the summer of 1988, I conducted research for a paper I eventually presented at the first Exotic Pest Plant Council (EPPC) Symposium which was held in November 1988 in Miami and was later published in a U.S. National Park Service Document (Schmitz et. al, 1991). I combed through historical documents and conducted interviews with employees and owners of Florida's aquarium plant farms and a former U.S. Department of Agriculture scientist to determine how invasive non-native aquatic plant species were first introduced into our state. At that time, I was a state regulatory inspector of the aquarium plant industry and regularly visited these farms in Central and South Florida and got to know the farmers. Many of them freely shared their memories of when their industry was new just after World War II and when the importation of live tropical plants from other parts of the world became possible with the availability of air cargo shipments.

After I presented my paper at the EPPC symposium, I retained a strong interest in determining how these invasive plants that we commonly control today were first introduced into North America. With a new research tool available to me in the 1990s, the internet, I continued to add to my knowledge about their introduction history. The following is the information I gathered through the years regarding the introduction of waterhyacinth and hydrilla into the U.S. and Florida.

Waterhyacinth

Waterhyacinth may have been present in New Orleans before the World's Industrial and Cotton Centennial Exposition, which has historically been linked with its introduction into North America. Water-



Figure 1. That "beautiful bloom" of waterhyacinth. Photo courtesy Lyn Gettys.

hyacinth (*Eichhornia crassipes*), a native of South America, is commonly believed to have been first introduced into the United States at this Exposition which was held in 1884-85 in New Orleans, Louisiana (Klorer, 1909; Anonymous, 1956; Tabita

and Woods, 1962; Weldon et al., 1969; Vietmeyer, 1975). Klorer (1909) was the first person to link waterhyacinth's introduction to the Exposition, but not specifically to the species being imported by any of the South American exhibits or

being shown at the Exposition. To quote Mr. Klorer from his 1909 paper:

"It made its appearance here at the time of the Cotton Centennial Exposition in 1884, being shown then as an exotic plant which readily made friends on account of its beautiful bloom and the little difficulty experienced in growing it. From New Orleans some of the plants were taken to the surrounding parishes and cultivated in ponds and in gardens as admirable aquatic specimens."

Other published papers reported that waterhyacinth was imported from the Orinoco River in Venezuela by members of the Japanese exhibit at the same World's Industrial and Cotton Centennial Exposition and were given away to Exposition visitors as souvenirs (Gowanloch, 1944, 1945). Curiously, there is no mention of waterhyacinth in the informational brochures and catalogs from the Exposition's Japanese and Venezuelan exhibits, which contain extensive information regarding imported horticultural species. Furthermore, there was no mention of waterhyacinths from the other Central and South American exhibits and/or their displays, or at Tulane University and Louisiana State archives. Similarly, magazine articles and a book published about the Exposition do not mention this beautiful and unusual floating water plant (Fairall, 1885; Smalley, 1885a, b). Gowanloch's papers include statements assigning the responsibility for introducing

the waterhyacinth at the Exposition to the Japanese. These are the first and earliest references pointing to the Japanese as accountable. Coincidentally, it should be noted that anti-Japanese public sentiment was high when these papers were published in the mid-1940s.

There are other reports that waterhyacinth was in North America twenty years earlier (United States Congress, 1898; Tabita and Woods, 1962), and may have been cultivated as a greenhouse and landscape exotic plant shortly after the U.S. Civil War (Penfound and Earle, 1948). Seidenberg (1990) found information pointing to a wealthy amateur botanist and plant collector who may have had it before the Exposition. Dr. Tobias Richardson, the **Dean of the School of Medicine** at Tulane University (from 1865 to 1885), and his wife, Ida, were amateur botanists, plant collectors, and world travelers and spent time in the Amazon and Peru sometime during the 1870s and early 1880s. They traveled to the Amazon River Basin and collected exotic plants, one of which may have been the waterhyacinth, and brought them to their home in New Orleans before 1884.

Their residence in New Orleans was known as "Palm Villa" and once contained a world collection of palms and ferns and a greenhouse with orchids (Seidenberg, 1990). They also introduced many foreign plant species into New Orleans (Ewan, 1965). Their property had a water garden with several plant species obtained from South America, one of which was the

Amazon water lily (*Victoria regia*) and another being waterhyacinth. Note the description of the flora in a pond on his property written by Dr. Richardson for an article he wrote in a horticulture journal (Richardson, 1886):

"In our pond, which is cemented, we grow several species of Nymphaea, of which devoniensis and rubra are the most satisfactory; also Nelumbiums (speciosum and luteum), Pontederia crassipes, Limnocharis humboldti, Pistia, and Trapa."

Pontederia crassipes is a synonym for *Eichhornia crassipes*. This confirms that he had waterhyacinth on his property although the article was published a year after the Exposition closed. But remember, he traveled and collected plants from South America during the 1870s and early 1880s, several years before the Exposition. More evidence suggesting that Dr. Richardson collected waterhyacinth from South America and introduced it into the New Orleans area was that the species was commonly known for a while as the "Richardson Lily" (Seidenberg, 1990).

In addition, Palm Villa was located just off St. Charles Avenue—a major thoroughfare between the Exposition and the French Quarter (about 2 miles from the site of the 1884-85 Exposition, now Audubon Park). Even back then, the French Quarter was a tourist attraction and included many hotels where attendees



St. Johns River - 1931

Figure 2. Waterhyacinths clogging the St. Johns. Image courtesy UF/IFAS Center for Aquatic and Invasive Plants.



Steamer Alligator - Palatka - 1899

Figure 3. A steamer named "Alligator" trying to work its way through the waterhyacinths. Image courtesy UF/IFAS Center for Aquatic and Invasive Plants.

of the Exposition would likely have stayed during their visit to New Orleans. Palm Villa exotic flora was well-known in the New Orleans area during that time and at least some of the visitors to the Exposition may have gone there during their stay. By the time the Exposition concluded in May 1885, the Expo had attracted more than 1 million visitors, including an estimated 36,000 the week of Mardi Gras. Considering how prolific waterhyacinths can grow in a small water garden, if Dr. Richardson had them on his property during the Exposition and entertained Expo visitors, he may have been giving away a few waterhyacinths on a weekly basis.

The introduction of waterhyacinth into Florida is better documented. It apparently occurred after Mrs. W. F. Fuller brought waterhyacinths home from New Orleans in two tin pails (Barbour, 1944) and placed the plants in her fish pond located on the banks of the St. Johns River, near Palatka, in 1884 (Anonymous, 1896; Tabita and Woods, 1962). It should be noted that there are other reports that she actually obtained waterhyacinth from Europe instead of New Orleans (Anonymous, 1896; United States Congress, 1898). The plants in her pond fountain quickly multiplied and the excess plants were innocently discarded into the St. Johns River. The owner of a farm grove who claimed to have introduced this exotic plant into Florida was interviewed in 1896 (Anonymous, 1896) and stated “the people of Florida ought to thank me for putting these plants here.”

The ultimate result of this introduction was an economic and ecological catastrophe. By 1893, waterhyacinth was already becoming a nuisance by hindering boat navigation on the St. Johns River (Buker, 1982). A few years later (1896), the species had spread throughout most of the river system, assisted by cattlemen who introduced waterhyacinth from water basin to water basin because they thought waterhyacinths would make good cattle feed (United States Congress, 1957). By the late 1950s, it was estimated that waterhyacinth occupied over 51,000 hectares of Florida's waterways (United States Congress, 1965).



Figure 4. Hydrilla. Photo courtesy Lyn Gettys.

Hydrilla

The following information regarding the first introduction of hydrilla into Florida is based on an interview I conducted with Mr. Don Jennings in 1988, a man then in his late 70s, who managed an aquarium plant farm located in the outskirts of Tampa. According to Mr. Jennings, hydrilla was first introduced into the U.S. in Missouri. Mr. Otto Beldt of St. Louis, Missouri, one of the early pioneers in the tropical fish/aquatic plant mail-order trade in the U.S., imported from Ceylon (now Sri Lanka) what he thought was another species of *Anacharis* (a submersed plant commonly sold in aquarium stores). Laboratory molecular tests conducted in the 1990s indicate a Southern India/Sri Lanka origin of Florida hydrilla (Madeira, P. T. et al., 1997), confirming Mr. Jennings' account.

Because Mr. Beldt enjoyed sharing his new finds with others in his profession, the

St. Louis tropical fish and plant farmer sent six small bundles (about 10 inches long and 6 inches wide) in either 1950 or 1951 to another aquatic plant farmer, Mr. Albert Greenburg, in the Tampa Bay area. Mr. Greenburg had established the first tropical fish and aquarium plant farm in Florida in 1932; he was also the first inductee into the Florida Agriculture Hall of Fame. Mr. Greenburg conducted his business from two locations: one to grow plants on the outskirts of the city and the other near the Tampa airport on Cypress Street for shipping and receiving plant material.

Mr. Greenburg was not impressed with the color and overall appearance of this new, potential aquarium plant sent by Otto Beldt. Believing that he had little commercial use for this species, the Tampa Bay farmer told his employee (Mr. Jennings) at the shipping and receiving location to do whatever he liked with them. Mr. Jennings



Figure 5. A re-creation of the six bundles of hydrilla that started it all. Photo courtesy Don Schmitz.

almost threw the six bundles into the trash. At the last moment, before ending his work day, he decided to keep the plants alive by storing them in a small wire cage in a canal located at the back of their business off of Cypress Street. Then he forgot about them.

Several months later, when a shipment of live plant material destined for the northern U.S. missed its flight, Mr. Jennings traveled out to the canal to store these aquatic plants overnight for shipment the next day. Much to his surprise, the vine-like submersed plant species that he had placed into the wire cage months before had escaped and spread throughout the canal. The Tampa Bay farm then decided to market this plant under the name “Indian Star Vine.” The first south Florida farmer to receive “Indian Star Vine” was located near Old Cutler Road in southeastern Miami. A former employee of this farm recalled that “Indian Star Vine” was being grown and sold as an aquarium plant when she started this job in 1955. Substantial quantities of their aquarium plants were also collected from Black Creek not far from their farm. Although another former employee denies the deliberate planting of “Indian Star Vine” into the creek, it had become established there by 1959.

In 1960, the Central and Southern Flood Control District (now the South Florida Water Management District) contacted personnel from the U.S.D.A. Plantation Field Station regarding a severe aquatic weed infestation in the Snapper

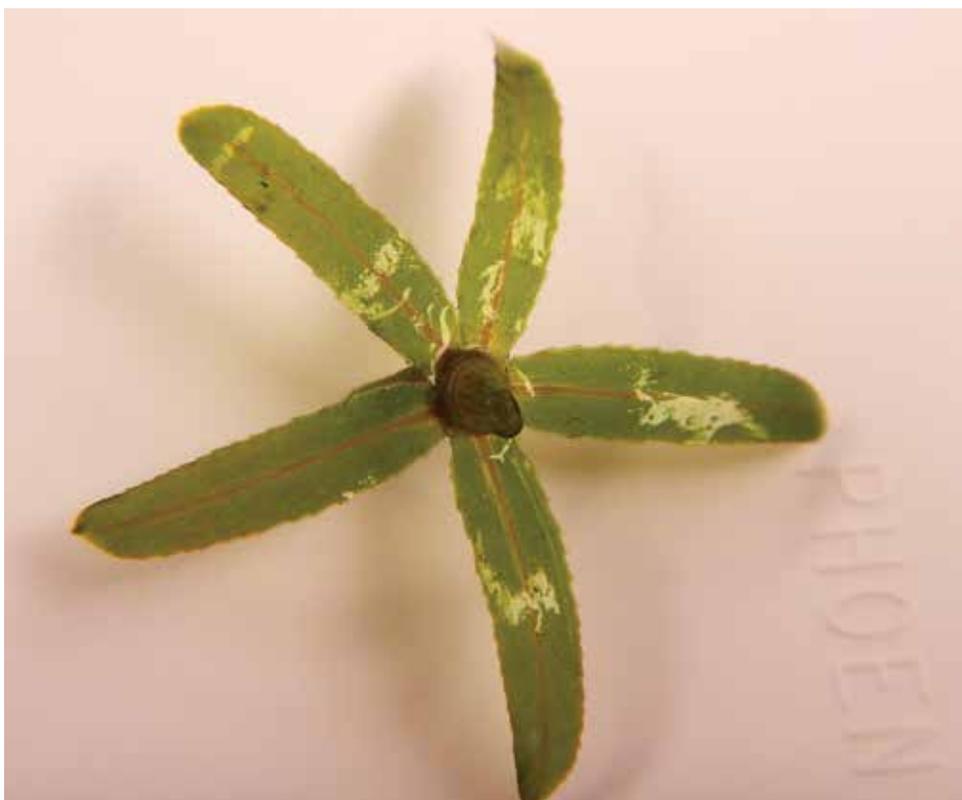


Figure 6. A likely reason hydrilla was referred to as “Indian Star Vine.” Photo courtesy Lyn Gettys.

Creek Canal located in southern Miami (Blackburn et al., 1967). Dr. Lyle Weldon and Dr. Bob Blackburn, then U.S.D.A. scientists, obtained samples of this new submersed aquatic plant species and sent them to the University of Florida in Gainesville, Florida and the Smithsonian Institution in Washington, D.C. for identification. Unfortunately, the samples were misidentified by both institutions as *Elodea canadensis*, a common water plant native to the U.S.

By 1965, Dr. Weldon and Dr. Blackburn noticed something odd about this species that had been identified as *Elodea canadensis*. A plant obtained by them from Lake Osborne in Palm Beach County had a subterranean tuber attached to its roots. They speculated that the original identification was incorrect because *Elodea canadensis*, and for that matter, another look-alike species, *Egeria densa*, do not produce tubers or subterranean vegetative propagules. Almost immediately, they sent another sample of “Indian Star Vine” to Dr. Harold St. John, a recognized authority on the genus *Elodea*. This time, it was correctly identified as *Hydrilla verticillata*. Ironically, Dr. Weldon, the U.S.D.A. scientist who was

instrumental in confirming the first hydrilla infestation in North America, lost his life entangled in hydrilla in a SCUBA diving accident in 1972.

Hydrilla rapidly spread throughout Florida during the 1960s and throughout the South in the 1970s. By 1988, hydrilla infested over 22,000 hectares of Florida’s water bodies, with more than 6,000 hectares being controlled annually. Only the female biotype of hydrilla is known to be infesting Florida’s waterways. But in 1982, hydrilla obtained from a northern plant nursery produced male and female flowers, confirming the monoecious biotype had been introduced into North America (Steward et al., 1984).

Sometime in the early 1970s, legend has it that former Florida Congressman Louis Frey’s favorite fishing hole in Central Florida had become clogged with hydrilla, preventing him from fishing as he always had. Supposedly, he was so outraged that he filed and sponsored a Congressional Bill in 1973 that eventually became the U.S. Federal Noxious Weed Act, which was signed into law in 1975 and established the U.S. Federal Noxious Weed list. Adding some credibility to this legend was a

sentence about hydrilla in the report that accompanied the Senate Bill for the U.S. Federal Noxious Weed Act (United States Congress, 1974):

“... hydrilla, which was imported for use as an ornamental in home aquariums and accidentally released into Florida waterways... the weed clogs waterways and is ruinous to fishing.”

References:

Anonymous. 1896. Clogged by hyacinths: navigation on the St. John's, Florida, seriously obstructed. The New York Sun, September 20, 1896.

Anonymous. 1956. Did you know? Article from the Transit Rider's Digest, July 2, 1956, 4 pp.

Barbour, T. 1944. That Vanishing Eden – A Naturalist's Florida. Little, Brown and Company, Boston, MA.

Blackburn, R. D., K. K. Steward, and I. W. Weldon. 1967. USDA Agricultural Research Service Weed Investigations Aquatic and Non-Crop Areas Annual Report for 1967. USDA, Plantation Field Laboratory, Fort Lauderdale, Florida. 58 pp.

Buker, G. E. 1982. Engineers vs. Florida's green menace. The Florida Hist. Quart., April: 413-427.

Ewan, J. 1965. Letters from Charles Sargent to Reginald Somers Cocks 1908 –1926, Arnold Arboretum of Harvard University.

Fairall, H. S. 1885. The World's Industrial and Cotton

Centennial Exposition, New Orleans, 1884-85. Republican Pub. Co., Iowa City, Iowa. 404 pp.

Gowanloch, J. N. 1944. The economic status of the waterhyacinth in Louisiana. Louisiana Conservationist 2: 3-8.

Gowanloch, J. N. 1945. Economic importance of the waterhyacinth, *Eichhornia crassipes*, in management of water-areas. Pages 339-345 in: Trans. 10th N. Amer. Wildlife Conf.

Klorer, J. 1909. The waterhyacinth problem. J. Assoc. Eng. Soc. 42: 42-48.

Madeira, P. T., Van, T.K., Steward, K.K., and R.J. Schnell. 1997. Random amplified polymorphic DNA analysis of the phenetic relationships among world-wide accessions of *Hydrilla verticillata*. Aquatic Botany 59: 217-236.

Penfound, W. T., and T. T. Earle. 1948. The biology of the water hyacinth. Ecol. Monogr. 18: 448-472.

Richardson, T.G. 1886. A New Orleans Garden. The Garden: An Illustrated Weekly Journal of Horticulture in all its Branches, Volume 30, December 25, 1886, pages 581-582.

Schmitz, D.C., Nelson, B.V., Nall, L.E., and J.D. Schardt. 1991. Exotic Aquatic Plants in Florida: A Historical Perspective and Review of the Present Aquatic Plant Regulation Program. In: Proceedings of the Symposium on Exotic Pest Plants (Center, T.D. et al., eds.), Held on November 2-4, 1988, University of Miami, Rosenstiel School of Marine and Atmospheric Science, Miami, Florida. United States Department of the Interior, National Park Service Document, Washington D.C. Pages 303-323.

Seidenberg, C. 1990. The New Orleans Garden. Silk-

mont and Count, New Orleans. Pages 456-457.

Smalley, E. V. 1885a. The New Orleans Exposition. Cent. Mag. 30: 3-14.

Smalley, E. V. 1885b. In and out of the New Orleans Exposition. Cent. Mag. 30: 185-199.

Steward, K. K., T. K. Van, V. Carter, and A. H. Pieterse. 1984. Hydrilla invades Washington, D.C. and the Potomac. Amer. J. Bot. 7:162-163.

Tabita, A., and J. W. Woods. 1962. History of waterhyacinth control in Florida. Hyacinth Cont. J. 1: 19-23.

United States Congress. 1898. Water hyacinth obstructions: letter from the Acting Secretary of War. 55th Congress, Document no. 91.

United States Congress. 1957. Water hyacinth obstructions in the waters of the Gulf and south Atlantic states: Letter from the Secretary of the Army. 35th Congress, Document no. 37.

United States Congress. 1965. Expanded project for aquatic plant control: Letter from the Secretary of the Army. 89th Congress, Document no. 251.

United States Congress. 1974. Control of Noxious Weeds Report. 93rd Congress. Report 93-1313.

Vietmeyer, N. D. 1975. The beautiful blue devil. Nat. Hist. 9: 65-72.

Weldon, L. W., R. D. Blackburn, and D. S. Harrison. 1969. Common aquatic weeds. USDA Agric. Handbook No. 352, 43 pp.

Don C. Schmitz (dcschmitz@comcast.net) is Executive Director of the North American Invasive Species Network headquartered in Gainesville, Florida.



Give your aquatic herbicides a kick start.

Our line of aquatic surfactants will give your spray program extra kick.

You'll get improved wetting, sticking and penetration for all types of aquatic herbicides. Our surfactants are made from natural citrus peel oil and are easy to mix and apply. This season, put some extra kick into your aquatic spray program with nonionic spray adjuvants like Cide-Kick from Brewer International. **Add Cide-Kick!**

To order call your local distributor or
800-228-1833

P.O. BOX 690037 • VERO BEACH, FL 32969
T: 772- 562-0555 • F: 772-778-2490
MEMBER OF: APMS, AERF AND RISE
WWW.BREWERINT.COM



Aquavine

AERF – What Is It Wednesday!?!?

Are you a social media junkie? Need to add to your wardrobe? Good with aquatic plant ID? Well, we have the game for you! Next time you are perusing your timeline on a Wednesday, stop by the Aquatic Ecosystem Restoration Foundation's Facebook page and test your identification skills. Each and every Wednesday, AERF posts a photo of something aquatic-related. The first person to guess correctly will receive a FREE AERF t-shirt. Answers will be announced each Thursday, so the next time you are bored on a Wednesday, stop by and play!