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## USE OF NATIVE AQUATIC PLANTS AS BACKYARD ORNAMENTALS

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**Abstract.** Florida's warm temperatures and bright sun provide ideal conditions for growth of many plants. Aquatic plants are important to Florida because of their natural resource and ornamental value. Water-lilies (*Nymphaea* spp.) and lotuses (*Nelumbo* spp.), because of their large, beautiful flowers, are the most well-known of all aquatic plants for their ornamental value. However, a number of Florida's native aquatic plants have potential as ornamentals to provide new additions to the plant production industry. Swamp-lily (*Crinum americanum* L.), alligator-lily (*Hymenocallis palmeri* Watson), Everglades

spider-lily (*Hymenocallis floridana* (Raf.) Morton), *Hymenocallis rotata* (Ker. Gawl.) Herb., water dropwort (*Oxypolis filiformis* (Walt.) Britt.), common arrowhead (*Sagittaria latifolia* Willd.), *Sagittaria stagnorum* Small, lizard's tail (*Saururus cernuus* L.), sky flower (*Hydrolea corymbosa* Macb. ex Ell.), and marsh-mallows (*Hibiscus* spp.) are a few of Florida's native aquatic plants that have potential as backyard ornamentals.

Aquatic plants have been cultured for their ornamental value for thousands of years. Numerous species appear as motifs in ancient works of art (Sculthorpe, 1967) indicating their importance to early civilizations. In ancient times a number of aquatic plants were cultured also for nutritional and medicinal purposes. Currently, aquatic plants are grown primarily for their ornamental and natural resource value, and a few species are cultured for food.

Species of lotus (*Nelumbo*) and water-lily (*Nymphaea*) because of their large, beautiful flowers have received the most attention for their ornamental value by the ancients as well as modern societies. Modern cultivation of water-lilies as ornamentals is generally considered to have begun with the introduction of fragrant water-lily (*Nymphaea odorata* Ait.) from North America to England in 1786 (Sculthorpe 1967). Since that time, a large assortment of hybrid water-lilies have been developed. These hybrids provide a much greater display of colors, shapes, and sizes of flowers than their parents.

Other aquatic species would be of value to complement water-lilies and lotus for use in backyard aquascaping. A number of aquatic plants native to Florida have potential as ornamentals; however, information is lacking on their ornamental value. The objective of this paper is to present information on several of Florida's native aquatic plants that have usefulness as backyard ornamentals.

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## Swamp-lily and Spider-lilies

Members of the Amaryllis family which have potential in backyard aquascaping include swamp-lily (*Criinum americanum* L.) and the spider-lilies (*Hymenocallis palmeri* Watson), (*Hymenocallis floridana* (Raf.) Morton), and (*Hymenocallis rotata* (Ker. Gawl.) Herb.). These plants are attractive as ornamentals because of their large, white, showy flowers, and flattened and broadly straplike leaves.

Swamp-lily is also commonly called string-lily in reference to its narrow sepals and petals. Also, swamp-lily has rough leaf margins. This roughness is not severe enough to cause injury, but is useful in distinguishing swamp-lily from the spider-lilies when their flowers are not present because the leaf margins of spider-lilies are smooth.

Swamp-lily and the spider-lilies are perennial herbs that occur naturally in wetlands. They will tolerate intermittent drying. Swamp-lily is found throughout Florida. *H. floridana*, also commonly called Everglades spider-lily, grows in south Florida perhaps indicating its need for warm temperatures. *H. rotata* is found in north central Florida. Swamp-lily plants grow as solitary individuals or in clumps, and are more abundant in Florida than the spider-lilies.

The leaf bases of these plants arise alternately and sheath each other forming a stalklike portion above a tunicated bulb. The leaves may grow to 0.5 m or more in height above the bulb.

Flowers of these plants have large white petals, and are delicately fragrant. However, those of the swamp-lily may be streaked with pink. The most striking difference between these plants is the conspicuous white, thin-membranous flaring cup connecting the lower portions of the filaments of flowers of the spider-lilies as contrasted with the open arrangement of the petals for swamp-lily. This membranous cup with the upper filaments remaining free resembles the web of a spider, hence the name spider-lily. Flowering begins in the spring and continues until the fall for swamp-lily. The spider-lilies flower primarily during the summer.

Swamp-lily and the spider-lilies may be propagated from seed and bulbs. The bulbs can be easily transplanted, and new offset bulbs form at the base and along short or long rhizomes. Rhizomes of the spider-lilies are rather short causing the plants to grow in single clusters whereas the rhizomes of the swamp-lily are long, contributing to its horizontal spread and growth in large monocultures.

## Water Dropwort

Water dropwort (*Oxypolis filiformis* (Walt.) Britt.) an herbaceous, dicotyledonous plant of the Carrot family (Umbelliferae or Apiaceae), is an ideal candidate as an aquatic ornamental because of its unique leaf shape and umbel shaped flowers. Its leaves are smooth, bladeless, nearly round, hollow phyllodes. Phyllodes are winged petioles with flattened surfaces placed laterally to the stem and function as leaves. The inflorescence of water dropwort is a compound umbel up to 10 cm in width composed of 12 to 22 small, less than 2 mm in width, individual flowers.

Plants in the genus *Oxypolis* are commonly called "Hog-fennels" apparently because of the attraction hogs have for these plants. Species in this genus occur in the coastal plain from North Carolina to south Florida, west to Texas, and in the Bahama Islands.

Water dropwort is the most abundant of four species of hog-fennels in Florida (Godfrey and Wooten 1981). The tolerance of water dropwort to intermittent drying conditions is unknown, but some of the areas in South Florida in which it occurs may be dry for part of the year.

Stems of water dropwort may grow to 2 m in length but they have few branches. The lower leaves are elongate and taper to 0.8 m in length. The phyllodia are partitioned by walls that are visible as rings around the phyllode. These phyllodes combined with the umbel inflorescence make water dropwort a unique addition, quite unlike other aquatic plants, to the aquatic landscape.

## Common arrowhead

Common arrowhead (*Sagittaria latifolia* Willd.), also commonly known as Wapato and duck-potato, is a herbaceous plant in the Alistamaceae family. Characteristics that make common arrowhead a desirable aquatic ornamental include its white, three-petal flower and its variable three-lobed, dark green leaf.

Common arrowhead occurs in wetlands, marshes, ditches, and floating tussocks throughout North and South America (Correll and Correll 1975). It may grow in water up to 1 m in depth. Often this species occurs in rather dense monocultures of plants.

The leaves and flowers of common arrowhead arise from rhizomes on separate stalks. The leaf blade is three-lobed with a terminal lobe and sagittate to hastate basal lobes. The lobes are highly variable as to overall size, size and shape of the lobes, and orientation of the basal lobes (Godfrey and Wooten 1981). Plants that grow in south Florida have very broad basal lobes as contrasted with the more narrow, pointed lobes on plants from other areas of the country.

Flowers of common arrowhead are in racemes on stalks about the same height as the leaves. Staminate flowers are positioned above the pistillate ones, and the pistillate flowers ripen prior to the staminate to prevent self-pollination. The plants bloom year round in South Florida. The flowers attract white peacock butterflies and perhaps other species.

Common arrowhead may be propagated from seed, corms, and rhizomes. Single plants under optimum growth conditions spread by rhizomes and may produce up to 214 plants per m<sup>2</sup> within 16 weeks (Sutton, 1995).

## *Sagittaria stagnorum*

Another member of the Alistamaceae family that has ornamental value is *Sagittaria stagnorum* Small. This species is a perennial that occurs in lakes, ponds, and streams along the eastern coastal from perhaps as far north as Massachusetts to Florida and west to Alabama (Godfrey and Wooten 1979). It does not tolerate drying. The plant reproduces by seed, rhizomes, and corms.

As is characteristic of all species in the genus *Sagittaria*, the flowers of *S. stagnorum* have three white petals. Their flowers float just above the surface of the water. At times, the flowers of *S. stagnorum* may become so abundant that the surface of water appears white when viewed from a distance (Godfrey and Wooten 1979). Flowers form year-round, with heavier flowering during the warmer months of the year. Seeds mature under water.

A unique feature of this aquatic plant is that it will produce submersed, floating, and emersed leaves on the same plant. The submersed leaves are ribbonlike, thin, and flexuous. Leaves that float on the surface have long petioles with elliptic, oval, or ovate blades. The emersed leaves are shaped similar to the floating ones but have a stouter petiole to hold the blade above the surface of the water.

#### Lizard's tail

Lizard's tail (*Saururus cernuus* L.) is a beautiful perennial herb with stems to 1.2 m tall. It occurs from southeastern Canada to Florida and west to Texas (Godfrey and Wooten 1981). These plants have dark green ovate-cordate leaf blades with petioles shorter than the blades. Flowers occur in a stalked, slender white-yellow raceme, curved or nodding distally to about 3 cm in length, hence the name lizard's tail (Dressler et al. 1991). The flowers are mildly fragrant. The combination of dark green leaves and fragrant flowers make these plants an attractive plant for aquascaping.

Lizard's-tail grows in full sun, but will also be found in shaded areas. The internodes lengthen and the leaves are not as dark green under shade. It may be found growing in dense monocultures. Plants are easily propagated as cuttings. Roots rapidly form at the nodes of cut apical stems. Information is lacking on propagation from seed and nutritional requirements of the plant.

#### Sky Flower

Sky flower (*Hydrolea corymbosa* Macb. ex Ell.) is a perennial herb that occurs in swampy woodland, marshes, and ditches in the coastal areas of Georgia and Florida (Godfrey and Wooten 1981). It has slender rhizomes and erect stems 60 to 80 cm in height. Its flowers have five deep-blue petals that make it a potentially attractive addition to aquascaping. The blue color of its petals does not photograph well (Taylor 1992) thus limiting its visual presentation in plant publications. Little is known of the growth requirements of sky flower or ways to propagate it.

#### Marsh-mallows (*Hibiscus* spp.)

The marsh-mallows are members of the Mallow family (Malvaceae) that grow in open, shallow water. Six species of *Hibiscus* occur in Florida. *Hibiscus grandiflorus* Michx. has a large, beautiful flower with pink petals and appears to have the most potential of the six species as an aquatic ornamental.

*H. grandiflorus* may grow to 3 m in height with few to several stems from its basal crowns (Godfrey and Wooten 1981). Its ovate leaf blades may grow to 16 cm at the base. Petals of its flowers may be 12 to 14 cm in length.

Plants of *H. grandiflorus* may be produced from cuttings or seeds. It easily roots from cuttings by sending out many roots from the nodes. Little is known of its nutritional requirements.

#### Fertilization practices

Aquatic plants may be cultured in almost any size water tight container to keep them in a flooded condition. The size

of the plant will determine the size of containers selected. A number of different size containers for growth of aquatic plants are available from nursery suppliers.

Standard culture practices for aquatic plants developed at the University of Florida's Fort Lauderdale Research and Education Center include using sand as the rooting media and controlled release fertilizer with macro- and micro-nutrients. For best growth, the fertilizer needs to be placed under the roots of the plant. The depth at which the fertilizer is placed in the sand will depend on plant size. For large plants, the fertilizer may be placed on the bottom of the container, and then covered with sand. Placement of the fertilizer at a depth of a couple of centimeters below the roots will allow room for root growth yet allow the roots to be in close proximity to the fertilizer. The fertilizer can be mixed in the sand or added as a layer. Layering is an easy way to add fertilizer to the sand during the initial planting. However, later additions of fertilizer will require that it be pushed down into the sand.

The amount of fertilizer needed will depend on the aquatic plant under consideration. Although fertilization requirements for only a few Florida's native aquatic plants have been determined (Sutton 1991, Sutton 1993, and Sutton 1995), rates of 250 to 750 g of Sierra 17-6-12 plus minor formulated for a 9-month release rate per m<sup>2</sup> appear adequate for a number of aquatic plants. Studies are in progress to provide information on the proper amounts of fertilizer to provide for optimum growth of aquatic plants in containers for backyard aquascaping.

#### Collection of the Plants from the Wild

To protect populations of native aquatic plants, a permit from the State of Florida is required to collect, transport, and grow these plants. However, the home owner is not required to obtain a permit for plants purchased from an ornamental plant nursery. Questions concerning the necessary permits to collect and propagate Florida's native aquatic plants need to be directed to the Florida Department of Environmental Protection in Tallahassee.

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