



NEW! AQUATIC PLANT NOTES

Greetings! FDEP's Aquatic Ecology and Quality Assurance section is initiating a new feature—a periodic e-newsletter to inform Lake Vegetation Index (LVI) samplers and other plant-interested parties of new and noteworthy items related to aquatic plant identification in Florida. We will feature taxonomic updates, information on invasive exotics, and in-depth looks at macrophyte groups that are challenging to identify. Please see our first topic below, an update on *Ludwigia grandiflora* and *Ludwigia hexapetala*, two species that have been present in Florida for decades, but in recent years have been aggressively invading Florida waterways. These taxa are the subject of ongoing morphological and genetic research by Dr. Colette Jacono* and others. Recognition and accurate identification of these invaders is an important foundation to managing their spread.

**Collete Jacono, PhD., of the Florida Museum and the University of Florida Center for Aquatic Plants contributed to this newsletter.*

Introduction

The *Ludwigia* genus, commonly known as water primrose or primrose willow, is represented by approximately 30 species in Florida, all of them wetland or aquatic, and 22 of them identified in LVI sampling, frequently as co-dominant or dominant taxa. Nearly all *Ludwigia* species in Florida are native, with the exceptions of *Ludwigia peruviana*, an invasive exotic first added in 2007 to the Florida Exotic Pest Plant Council (FLEPPC) Category 1 List of Invasive Plant Species, and now the aquatic species *Ludwigia hexapetala* and *Ludwigia grandiflora*.

Taxonomic Status

These taxa have undergone a number of taxonomic revisions, and were most recently grouped together as the *L. uruguayensis* complex in Florida, with their nativity uncertain. In 2013, *L. hexapetala* was recognized as alien to Florida and added to the FLEPPC Category 1 list. Current taxonomic research indicates that distinct types within *L. hexapetala* are also alien to Florida. Ongoing genetic research is expected to reveal relationships between the *L. grandiflora* types that may help clarify its official status, as yet remaining in flux, (C. Jacono, personal communication). Some authorities do not currently recognize these two groups as separate species, noting a lack of morphological distinction. This determination, however, may be the result of relying on small studies that examined a limited set of regional herbarium specimens, and did not include all relevant morphological characters, a review of live material, or a combination of genetic and morphological work. There is certainly additional research to

be done to resolve the taxonomy of these aggressive aquatics in Florida, but current evidence is clearly pointing to the separation of these taxa as distinct biological species. It is important for those who observe these taxa in the field to note their morphological characteristics, growth habit, and locations, to take photographs, and to collect for further expert verification when necessary.

Field Identification

Ludwigia grandiflora and *L. hexapetala* are closely related, share morphological similarities, and overlap in measurement of several characters, but there are observable differences that can help to distinguish the two species. It is necessary to identify these taxa in the field, as their differences are seen primarily in their growth habit, and they exhibit significant morphological variability in response to environmental conditions. Examination of fresh plant material, rather than pressed specimens is the best way to make proper identifications.

- ❖ Both *L. grandiflora* and *L. hexapetala* are vigorous growers with alternate leaves and clear yellow flowers typical of the genus, but the petals and sepals of *L. hexapetala* are notably larger than those of *L. grandiflora*.
- ❖ Both *L. grandiflora* and *L. hexapetala* produce buoyant horizontal stems early in the growing season, but *L. hexapetala* produces extensive clusters of floating rosettes, with really wide and rounded leaves
- ❖ Both species have later season growth of vertical stems and leaves, and for both species, stems toughen, leaves become more lance-shaped with pointed tips, and stems and leaves develop hairs once plants mature and flower. Nevertheless, the upright stems of *L. grandiflora* are more lignified (rigid from more lignin in the cell walls), appearing nearly woody when mature and producing a good deal more, sticky, stem hairs.
- ❖ *L. hexapetala* is more aquatic in its habit, producing floating beds, while *L. grandiflora* is more of a shoreline emergent, or is on floating islands (built up tussocks of thickly matted detritus)
- ❖ Ranges of the two species overlap; Seed capsules have been found in very small numbers on *L. grandiflora* types in the field, yet both species spread primarily by clonal reproduction.
- ❖ *L. hexapetala* is known from along the St. John's River, all downstream of Lake Harney, from Hillsborough River Reservoir, and from Alligator Lake (Columbia); *L. grandiflora* is known from Lake Butler (Union), Lake Seminole (FL/GA), Lake Tohopekaliga, and Lake Poinsett.

Ludwigia hexapetala

- ❖ Softer stems, lax from the base
- ❖ Truly aquatic, floating habit in open water
- ❖ Produces horizontal runners and floating rosettes of big, rounded leaves early in the season
- ❖ Stem leaves oblanceolate to elliptic
- ❖ Big flowers, petals ~2.7 cm long



Top: *Ludwigia hexapetala* in the rosette stage at Hillsborough River Reservoir, Hillsborough Co. (photo courtesy of Gregory Lokuta).

Bottom: Close-up of *L. hexapetala* flower at Lake Harney, Volusia/Seminole Cos. (photo courtesy of Kelli Gladding)

Ludwigia grandiflora

- ❖ Stiffer stems, upright from the base
- ❖ Shoreline plant, or forming floating islands/tussocks
- ❖ Produces horizontal runners and floating rosettes of more elongated leaves early in the season
- ❖ Stem leaves lanceolate to elliptic
- ❖ Smaller flowers, petals ~2cm long



Top: *Ludwigia grandiflora* at Lake Butler, Union Co (DEP photo). Bottom: *L. grandiflora* at Lake Tohopekaliga, Osceola Co. (photo USACE/ERDC, 2016)