Roundleaf toothcup [*Rotala rotundifolia* (Roxb.) Koehne]

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Fig. 1. Roundleaf toothcup forms a floating mat in Tuscaloosa, AL.

Fig. 2. Roundleaf toothcup's foliage and flowers grow densely in the mats.

Fig. 3. Roundleaf toothcup's flowers grow in spike inflorescenses.

Introduction

Problems Created

Roundleaf toothcup is native to south and southeast Asia from India to Japan. In its native range, this *Rotala* species is reported to occur primarily in mountainous areas, including altitudes of more than 2600m (8500ft). However, roundleaf toothcup has been recorded in canals in southern Florida and a single pond on the University of Alabama campus in Tuscaloosa. Roundleaf toothcup is planted in Florida water gardens as a transition plant because it grows well from shorelines out to open water. This flexibility gives roundleaf toothcup a similar advantage to alligatorweed in fluctuating wetland margin habitats. Roundleaf toothcup was first observed in Florida in 1996, and by 2002 it was known to occur in three south Florida counties, in addition to the one Tuscaloosa, AL, population.

Regulations

This species was added as a Category One invasive species by the Florida Exotic Pest Plant Council in 2007. Presently, it is not listed as a potential threat by any other US state; however, it is a recognized weedy invasive species in Australia.

Description

Vegetative Growth

Roundleaf toothcup is readily distinguishable from native Mid-South species of the Lythraceae (loosestrife) family (other species of *Rotala*, along with species of *Ammannia*, *Cuphea* and *Lythrum*.). It has soft, somewhat succulent, stems that are dark pink to purplish, and branch abundantly, giving the plant a prostrate, creeping growth form. Aerial leaves (approx. 2.5cm [1in] long) are round to broadly ovoid and are either sessile or with short petioles. Submersed leaves are more linear to elongate-elliptical in outline, and appear distinctly four-ranked along submersed stems. Its creeping growth form permits roundleaf toothcup to form dense mats across the water's surface or along shorelines, with aquatic mats also producing very dense root systems.

Flowering

Roundleaf toothcup produces abundant rose colored flowers in dense racemose spikes at the tips of aerial stems. Both soil-rooted and floating plants are capable of producing flowers, and in some cases, both habits have been observed in flower simultaneously, during spring into early summer. Fruit are small capsules (~ 1.5mm long [0.5in]) that split along four sides to release seeds (~0.5mm length [0.2in]).

Dispersal

Roundleaf toothcup is capable of vigorous spread by stem fragments that root readily at nodes. In this capacity, it also is similar to alligatorweed, and regrowth rates have been documented in laboratory studies to be comparable to those of alligatorweed. A study in Florida demonstrated that roundleaf toothcup is capable of producing viable seeds that germinate and yield vigorous seedlings under moist, but unsaturated soil conditions. Little else is known about the ability of this species to reproduce sexually in its exotic US range.

Habitat

Roundleaf toothcup inhabits wetland areas, including low-lying fields, moist pond margins, and areas adjacent to dams and reservoirs. In the US, it is well known from urban canals in southern Florida. A population also was recorded in an urban pond in Alabama; that population is believed to have been extirpated. The related *Rotala indica* (Indian toothcup, also non-native in the US) occurs as a weed in rice cultivation in LA and CA, but is not known to occur outside rice paddies. This species is a serious threat for expansion because of its desirability as an aquarium species and its high growth rates (which cause it to outgrow aquaria in short periods of time).

Distribution

The known US distribution for roundleaf toothcup at the time of publication is in two watersheds of south Florida. The one population known from the Mid-South (Alabama) is thought to have been extirpated.

Control Methods

Biological

No biological control options are available.

Chemical

The systemic herbicide 2,4-D has been specifically tested on roundleaf toothcup. Suggested rates are included in Table 1. While other herbicides have not yet been tested, the contact herbicide diquat and the systemic herbicides glyphosate, imazapyr, penoxsulam, and triclopyr are likely to provide effective control. A nonionic surfactant is suggested for optimal control with all these products; use a surfactant approved for aquatic use. Use only herbicides labeled for aquatic use. Carefully read the label before using herbicide.

Herbicide	Spot rate	Broadcast rate	Surfactant	Notes
2,4-D	1.28 fl oz./gal	1.9 lbs ae/acre (4 pints/acre)	1.0% v/v nonionic surfactant	Systemic
Diquat	0.5% solution	4 lbs. ai/acre (2 gal/ acre)	0.25-1.0% Non-ionic surfactant	Short-term contact, fast acting
Glyphosate	0.75 - 1.5% solution	1-2 lbs ae/acre (4.5 – 7.5 pints/acre)	Nonionic surfactant at 0.25-0.5% v/v	Systemic with slow results
Imazapyr	0.5 – 5% Solution	0.5 – 1.5 lbs ai/acre (2 to 6 pints/acre)	Nonionic surfactant at 0.25% v/v	Systemic with slow results
Penoxsulam		0.03 - 0.09 lbs ai/acre (2- 5.6 fl oz./acre)	1% v/v nonionic surfactant	Systemic with very slow results
Triclopyr	1.0-1.5% solution (1.25 fl oz/ gallon)	1.5 – 6 lbs ae/acre (2 to 8 quarts/acre)	1% v/v nonionic surfactant	Systemic

Mechanical

While no techniques have been evaluated for roundleaf toothcup, hand removal of all stem fragments would probably be effective. Repeated removal may be needed for materials reinfesting sites from stem fragments or seed germination.

Physical

While no physical control techniques have been evaluated, it is likely that benthic barriers and mulches would be effective in controlling roundleaf toothcup.

References

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