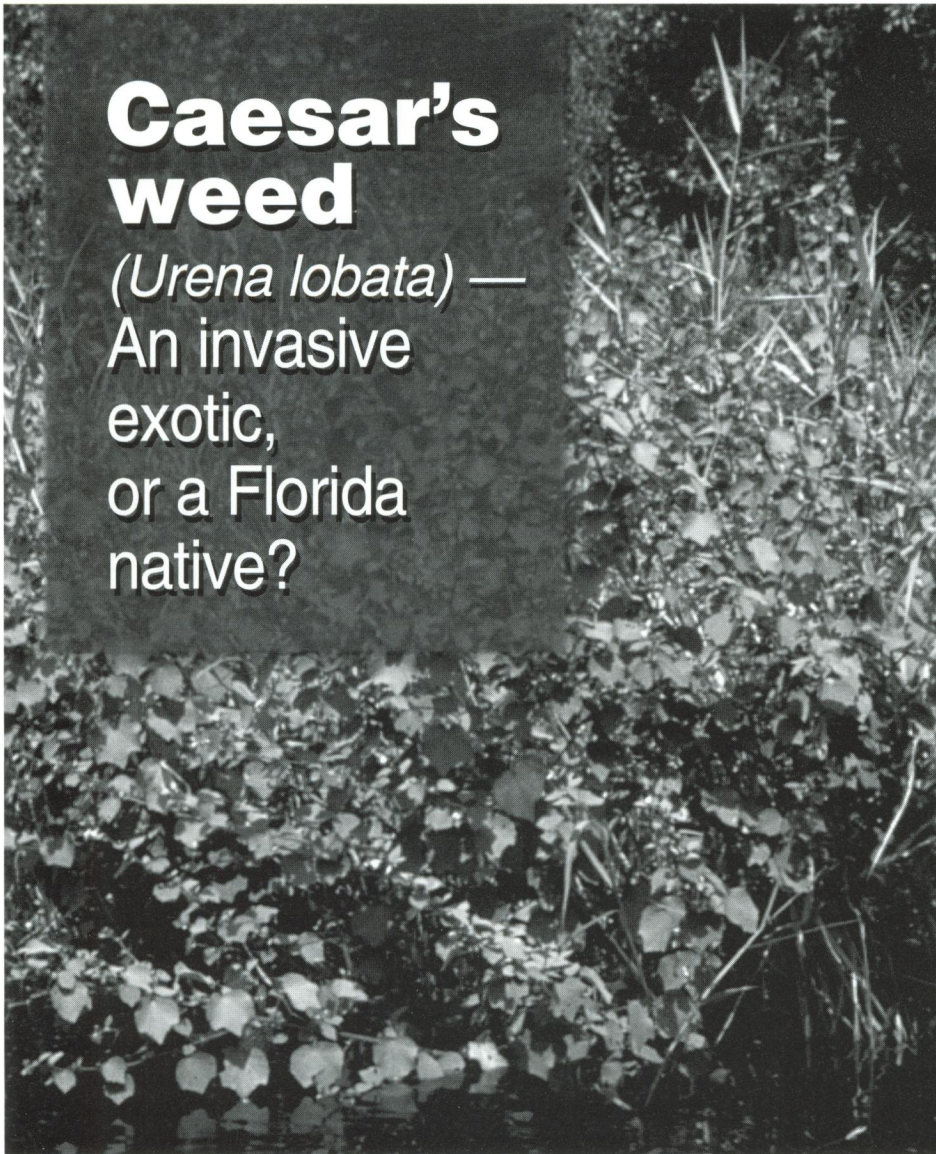


Caesar's weed

(*Urena lobata*) —
An invasive
exotic,
or a Florida
native?



By: Daniel F. Austin

During June 1999, the EPPC Invasive Plant Committee was asked why Caesar's weed (*Urena lobata*) was on the EPPC Most Invasive Plant list. After some discussion within the listing committee, I have been asked to prepare a written response.

To begin with, attempting to identify the native range for any plant is often an educated guess. Sometimes it is correct, sometimes not. A degree of uncertainty is what makes biological investigation interesting to many of us — we are constantly learning.

The second point I want to make is that it takes an enormous investment of time, energy and resources to untangle the convoluted histories of plants and their travels. There are never enough biologists around to

record the history of distribution and nativity of all species as they are discovered and/or dispersed. So, all that can be done is to try reconstructing the past by examining the record, and using a variant of what is called the "comparative method." That method is also used in reconstructing evolutionary trees. By comparing the known ranges of *Urena lobata* with its closest relatives, it may be possible to learn where it may have originated. If other historical data are congruent with that hypothesis, then it is more likely to be correct.

Urena lobata is a pantropical weed, as it has been since the 18th century, and also a cultivated crop in many regions. Morton (1981) listed tropical Africa, Brazil, Cuba, and the Malagasy Republic as regions where it was a commercial crop. Earlier, Dempsey (1975) de-

voted an entire chapter to the species, and noted areas of production in Angola, Brazil, the Malagasy Republic, Peru, and Zaire. The common name "Congo-jute" reflects its importance in the country we now know as Zaire.

Because it is such a widespread plant, some writers resort to statements about *Urena* such as "the true origin is not known." Other opinions have varied, with Dempsey (1975) thinking that Africa was its home, and Bates (1990) suggesting that it was Asia. Others, perhaps more wisely, simply voice no opinion (e.g., Correll & Correll 1982, Wunderlin 1982 1998).

History.

Caesar's weed was formally named by Carl Linnaeus as *Urena lobata*. That name was in his book *Species Plantarum* [vol. 2, p. 692. 1753] which marks the beginning of formal binomials for plants. In that book, Linnaeus named three species, *U. lobata*, *U. sinuata*, and *U. procumbens*. The first two he had previously treated in his own books, *Hortus Cliffortianus* [1738], *Flora Zeylanica* [1747], and *Hortus Upsaliensis* [1748]. He also cited Adrian van Royen's *Flora Leydensis* [1740] as a reference for the species. Linnaeus also referred to plates earlier published by Breynius [1678]. Plukenet [1696], Dillenius [1732], and Burman [1737]. The third name was given as a new species collected in the mountains of China by Carl Osbeck.

For some reason, Linnaeus considered China the native region for *U. lobata*, yet he used a common name from the Malabar coast of India for the genus. *Urena* is derived from the Malayalam word for the plant "urem" (Correll and Correll 1982, Bates 1990) or "uren" (Fryxell 1997).

The species was introduced into Florida according to the first flora of the southern United States (Chapman 1897). Moreover, it had already escaped into "waste places" by that time.

Allied Genera.

Classification of the Malvaceae groups genera into tribes, with *Urena* being considered most closely related to *Malvaviscus* and *Pavonia*. This trio of genera has been placed in a tribe called

the Malvaceae based on genetic, pollen, and morphological studies (LaDuke & Doebley 1995, Alverson et al., 1998, Judd & Manchester 1998).

The genus *Malva* has three species, all native to the Americas. There are six to eight species in *Urena*. At least four species are native to Asia (*U. repanda*, *U. procumbens*, *U. rigida*, *U. sinuata*), and two (*U. armitiana*, *U. australiensis*) are endemic to Australia (Fryxell & Craven 1989). *Urena sinuata* (India & Sri Lanka), *U. repanda* (India) and *U. rigida* (SE Asia) are considered by all authors as the closest relatives of *U. lobata*.

The genus *Pavonia* encompasses about 150 species, mostly tropical, with endemic species in Asia and the New World. Although Borssum Waalkes (1966) placed *U. rigida* and *U. repanda* in the genus *Pavonia*, he admitted that they were closer to *U. lobata* than any other species.

The genus *Malva* is distinctive because of its flowers. The petals never seem to open, and form a "tube" that accommodates pollinating hummingbirds. Because the flowers seem to stay closed, *Malva* is often called the "sleeping hibiscus." Distinguishing traits between *Pavonia* and *Urena* are



The genus *Malva* is distinctive because of its flowers. The petals never seem to fully open, forming a "tube" that accommodates pollinating hummingbirds. Photo by Amy Ferriter.

comparatively inconspicuous. Presence of glandular plant-hairs along the midrib on the lower surface of the leaf distinguishes *Urena*. Of these three genera, all data suggest that *Pavonia* and *Urena* are the most closely related. They are called "sister" genera in modern cladistic terminology because they

are more closely related to each other than any other genus in the Malvaceae.

Dispersal.

As anyone who ever walked through a patch of Caesar's weed knows, they are dispersed by animals. The sticky "spines" on the fruit segments easily cling to clothes and hair. That mechanism is common in plants, but usually aids in comparatively short-distance movements. For example, a tourist might carry the plant from Everglades National Park (or a Disney Parking lot) to their hotel. Even if they did not remove the seeds before going back to New York or Berlin, the plants would not survive in the cold of those two places. Besides, before the advent of long-distance travel via ocean-going vessels and airplanes, there would have been little chance of a Caesar's weed fruit traveling from one continent to the other. Birds that do travel between continents are notoriously poor dispersers of relatively large sticky seeds like these, although they do carry many other kinds. Moreover, long-distance avian travelers typically do not frequent the habitats occupied by this cotton and hibiscus relative.



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Urena is a plant mostly of disturbed places. We humans excel at that process, and create ideal sites for these tough-stemmed shrubs. The plants thrive in places like backyards, road shoulders, and trail sides. Caesar's weed is among what a biologist in the 1940s named "camp-followers" (cf. Anderson 1967)

Human Uses.

Virtually any plant that is pantropical, especially if it is a camp-follower, may be expected to have been used by humans. Caesar's weed is no exception, and Hocking (1997) says plants in the genus *Urena* have a number of uses. He notes that the leaves are used as emollient, demulcent, vulnerary, against gonorrhoea, as a hemostat, contraceptive, for liver disease, and applied as a poultice to ulcers. Flowers are expectorant and pectoral for coughs; also the whole plant is used in decoctions against coughs. Bark juice is used against dysentery. Seeds contain the fatty oil urease, and supposedly a 3% infusion of them is a potent vermifuge — yet they are consid-

ered edible. Stems furnish a textile fiber used as a jute replacement. Related species are used against tuberculosis, flu, dyspepsia and syphilis, and their roots and leaves are emollient, and expectorant. *Urena sinuata*, and probably *U. lobata*, are used as an adulterant of the mint "patchouly" or "patchouli oil" (*Pogostemon cablin*, *P. heyneanus*; Lamiaceae). That mint is used in perfumes, insect repellants, and the newly popular aroma therapy (Lawless 1995).

Hocking (1997) recorded these uses from Brazil, Dominica, Laos, Tonga, Trinidad, and Venezuela. A couple of other books would add India and the Malesian Islands, along with several other uses. However, the point is that this shrub has been following humans around for thousands of years, either as a deliberate part of their pharmacy, or as a useful camp weed. How much the uses in different regions reflect exchange of information versus independent discovery remains largely unknown.

What Is Known – A Summary.

We know from comparison that

Pavonia, the most closely related genus to *Urena*, is found throughout the tropics. *Urena lobata* became known to the scientific world in the late 1600s and early 1700s from India, Ceylon and China. All related species within *Urena* are also Asian. From Asia, Caesar's weed was subsequently found in countries around the globe as Europeans traveled from place to place and learned about the plants there. Most of the earliest records on newly discovered continents outside Asia do not list the plant, and we may infer that it probably was not present in those regions. That assumption is made because the shrub grows best near people, and those were the first places early explorers visited to study local economic products from plants. Humans are among the best vectors of *Urena* because they wear clothes to which the sticky fruits cling. Moreover, people have long used the various plant parts for fiber and medicine. The fiber use reached a peak between 1900 and World War II when that material was greatly in demand for ropes, string, and similar items. Various

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people in the world also use the camp-follower for medicines to treat a variety of maladies.

Because the species was first found in Asia, where there are close relatives endemic to that region, and where many early uses have been documented, it seems likely that *Urena* is native there. Not only do the limited data that I have support this conclusion, but those who have looked at many original resources I have not are in agreement (Borssum Waalkes 1966; Fryxell 1997; Bates 1990).

Et tu *Urena*?

Caesar's weed was added to the 1995 EPPC Most Invasive Plant List on the recommendation of Paula Benshoff and Jean Huffman (Myakka River State Park). These park guardians have recorded the species in hammocks. Indeed, the species is widespread in disturbed areas of the peninsula, and Wunderlin et al. (1996) record it in every county from Alachua south.

When a species is nominated, it is considered by the EPPC listing committee. We discuss the category and whether or not the species should be included. Category II, where *Urena* is listed, contains species that "have shown a potential to disrupt native plant communities." Many of the committee members have also found the shrubs as hammock understory components. In those sites, they at least occupy space that native species might otherwise occupy. By occupying space, and otherwise competing with native species that is currently unknown, they satisfy our view of "having the potential to disrupt native plant communities."

If a nominee receives a majority of committee member votes, based on the information submitted and the experience of all the members, the species is included on the updated list. Similarly, when information accumulates that a species may not be causing the problems that were formerly thought to occur, a species may be removed from the list.

This consideration occurs every two years when the committee re-examines the list. There are often species proposed for de-listing, and there are always those proposed for addition.

Some are removed, others listed, and still others held until more information is accumulated. The process is based on the best available information provided to a committee whose membership is drawn from an array of plant

*A degree of
uncertainty is
what makes biological
investigation
interesting to many
of us – we are
constantly learning.*

science specialties. A species is included on the list only when the majority of the committee is satisfied that there are enough data to warrant its inclusion.

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