

REINSTATEMENT OF *SCHINUS TEREBINTHIFOLIA* (ANACARDIACEAE) AS A COMPONENT OF THE ADVENTIVE FLORA OF ARKANSAS

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ABSTRACT

The only documented spontaneous occurrence of *Schinus terebinthifolia* in Arkansas was made by Peck in 1990 from Ouachita County. A single, cultivated plant of *S. terebinthifolia* was planted at a residence in the city of Camden. Numerous (about two dozen) escaped plants from seeds were produced during a two-year period from the cultivated plant. The population was extirpated after discovery to prevent further establishment and spread. The Arkansas *S. terebinthifolia* record possibly represents the most northern escaped occurrence of this species in the continental USA. Although previously documented outside of cultivation in Arkansas, *S. terebinthifolia* was not included in the 2006 *Checklist of the Vascular Plants of Arkansas*, the 2013 *Atlas of the Vascular Plants of Arkansas*, or covered in recent treatments of the woody flora of the state by Ogle et al. (2020) and Serviss and Tumilson (2021). This paper provides a detailed account of the escaped occurrence of *S. terebinthifolia* in Arkansas, along with photographs of the *S. terebinthifolia* voucher specimens and a key to the known genera of Anacardiaceae in the state. The potential for additional occurrences and establishment of *S. terebinthifolia* in Arkansas also is discussed.

In 1990, about two dozen escaped, juvenile plants of *Schinus terebinthifolia* Raddi (Brazilian peppertree, Christmasberry) were documented from the property of a residence in the city of Camden in Ouachita County in southern Arkansas (Peck 2003; Fig. 1). The escaped juveniles were produced from a single, cultivated plant of *S. terebinthifolia* that was planted by the property owner (Fig. 2). The juveniles occurred in a roughly 30 m² area around the cultivated plant. The plant persisted for two consecutive years (1988–1990) before intentional removal, and during that two-year period, produced the escaped plants from seeds that were dispersed over a portion of the property by birds. In 1990, the population was eradicated to prevent further establishment and spread. Although observed and documented as escaped in Arkansas, *S. terebinthifolia* was not included in the *Checklist of the Vascular Plants of Arkansas* (Arkansas Vascular Flora Committee 2006) or the *Atlas of the Vascular Plants of Arkansas* (Gentry et al. 2013), nor covered in recent treatments of the woody flora of the state by Ogle et al. (2020) and Serviss & Tumilson (2021). This publication serves to reinstate *S. terebinthifolia* as a component of the state's adventive flora.

The Arkansas record represents one of the most northern documented occurrences of *Schinus terebinthifolia* in the continental USA. A 2006 collection from South Carolina (*Bourgon*, no collection number, CLEMS), possibly represents an additional escaped occurrence of the species, well above the northernmost records from Alabama, California, Florida, and Texas. While not considered truly cold-hardy, *S. terebinthifolia* is somewhat cold-tolerant and will survive exposure to light freezing temperatures (Rorato et al. 2017; Osland & Feher 2019), with fairly rapid regrowth of plants from the stems even after short-term exposure to temperatures as low as -7°C (Osland & Feher 2019). Osland and Feher (2019) provide a threshold of minimum temperature tolerance (at ca. -11°C;

range from -8.9 to -12.4°C), where in environments with seasonal low temperatures above the threshold, *S. terebinthifolia* could be expected to occur. They also speculate that if climate change warms the southeastern USA only a few degrees ($+2$ to $+6^{\circ}\text{C}$) that the putative naturalized range of *S. terebinthifolia* could extend well northward from present, to include southern Arkansas. Much of the southern portion of the state currently is designated zone 8a, where yearly low temperatures typically range from -9.4 to -12.2°C , which is near the critical temperature threshold for the presence of *S. terebinthifolia* indicated by Osland and Feher. Hence, at least in some years, the winter temperature regimes in southern Arkansas are conducive to perennation and survival of *S. terebinthifolia*. It also is plausible that establishment of *S. terebinthifolia* during consecutive years with mild winters may allow persistence during more severe subsequent winters (Victor Maddox, Pers. Comm., 2021). While this species is not likely to become invasive and widespread in the state in the future, its adventive presence in Arkansas has been documented, and it potentially could be expected as an escape in extreme southern portions of the state, particularly if the warming trends in the southeastern USA tentatively associated with climate change continue.

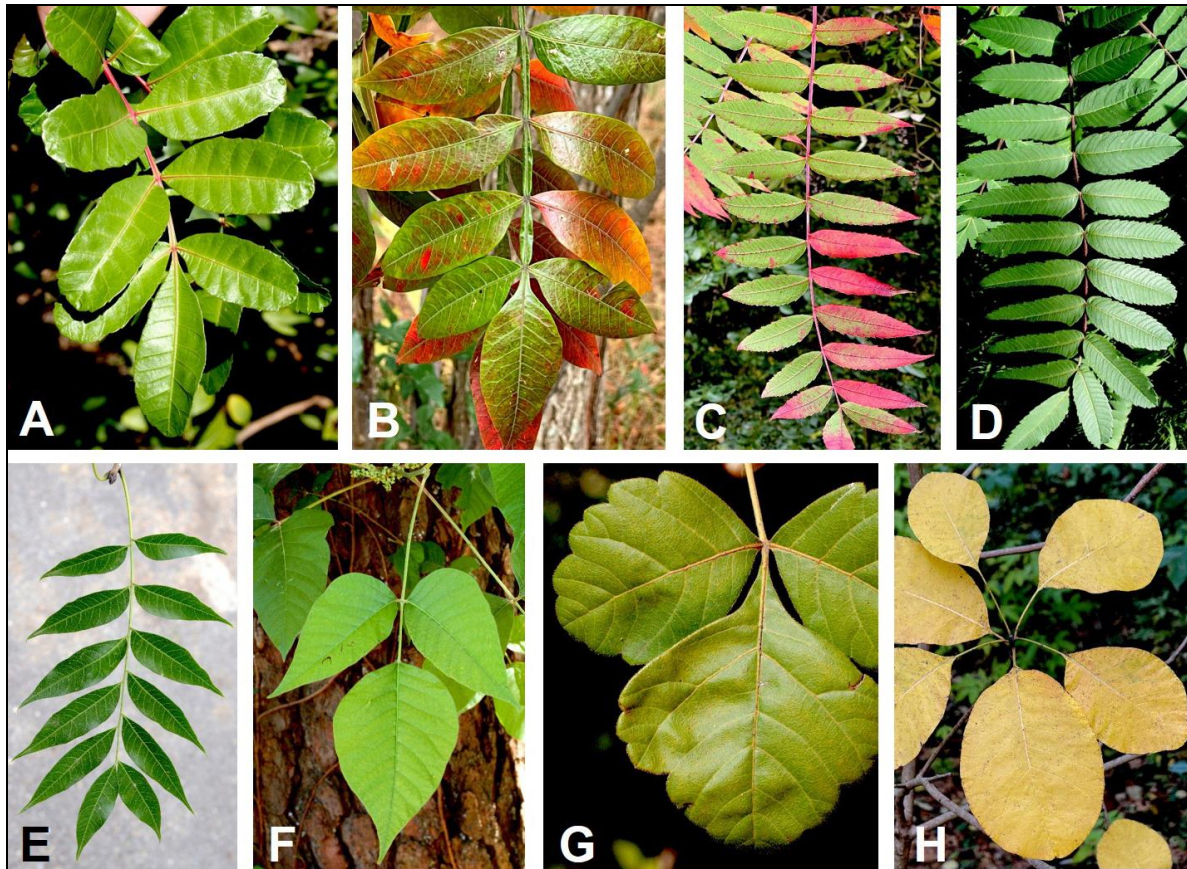


Figure 3. A–H. Comparison of genera and most species of Anacardiaceae in the Arkansas flora. A. *Schinus terebinthifolia*. B. *Rhus copallinum*. C. *Rhus glabra*. D. *Rhus typhina*. E. *Pistacia chinensis*. F. *Toxicodendron radicans*. G. *Rhus aromatica*. H. *Cotinus obovatus*. Photo credits: A: Stephanie Sanchez, Bugwood; B, C, H: Jada Welch, Henderson State University; D: Robert Vidéki, Doronicum Kft., Bugwood; E–G: Renn Tumblison, Henderson State University.

With the inclusion of *S. terebinthifolia* in the state's flora, Arkansas has five genera and about 10 species in the Anacardiaceae (see Fig. 3 for visual comparison of genera). Arkansas genera of Anacardiaceae can be distinguished using the following key.

1. Leaves simple **Cotinus**
1. Leaves compound with three or more leaflets.
2. Leaves ternately compound.
3. Plant a shrub; fruits red, glandular-pubescent **Rhus**
3. Plant a liana or small shrub to 1 m or less; fruits white to cream, glabrous or mostly glabrous with a few, scattered trichomes **Toxicodendron**
2. Leaves clearly pinnately compound with an obvious rachis and 5 or more leaflets, some plants may have a few leaves that are ternately compound.
4. Leaflets with entire to mostly entire margins.
5. Rachis of leaf prominently winged **Rhus**
5. Rachis of leaf without wing, or if wing present, then wing narrow and obscure (juvenile plants of *Pistacia* often have a winged rachis) **Pistacia**
4. Leaflets with toothed margins (some leaflets in *Schinus* may be entire or have small teeth).
6. Leaflets (9–)11–31; fruits glandular-pubescent; stamens 5 **Rhus**
6. Leaflets (3–)7–9(–13); fruits glabrous; stamens 10 **Schinus**



Figure 2. A–B. Cultivated plant of *Schinus terebinthifolia* from Ouachita Co., Arkansas. It was planted at a residence in the city of Camden in 1988 and persisted for two years until removal in 1990. During that time period, via self-seeding, it generated multiple spontaneous offspring at the property.

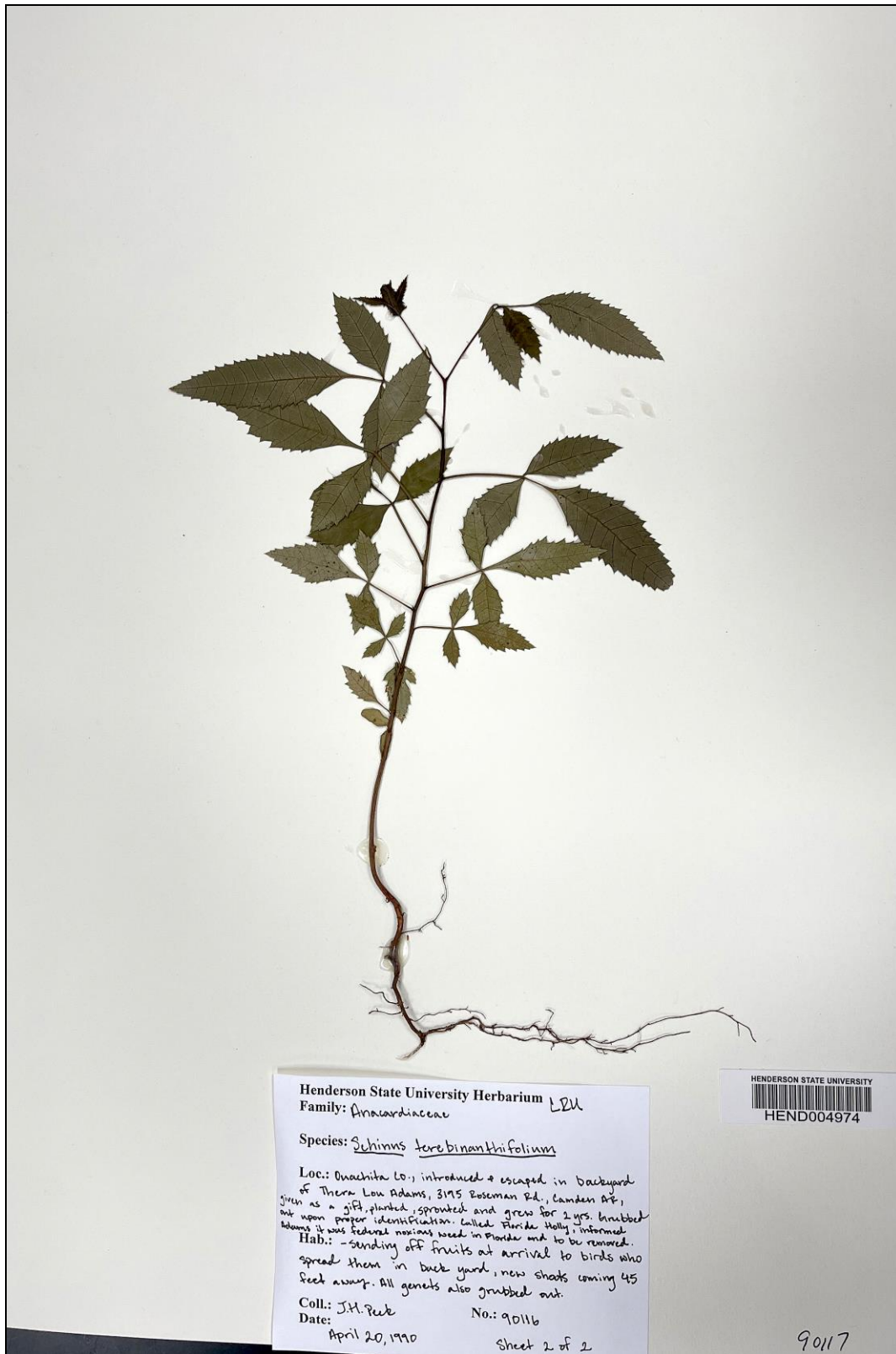


Figure 1. Escaped plant of *Schinus terebinthifolia* from Ouachita Co., Arkansas. About 24 escaped juvenile plants were present at the site and were distributed within a roughly 30 m² area around a cultivated *S. terebinthifolia* plant. Establishment of the juveniles was via bird-mediated dispersal of seeds.

Schinus terebinthifolia is considered invasive in a few states in the southern continental USA and elsewhere, including Hawaii, Puerto Rico, Australia, New Zealand, South Africa, and some areas of southern Europe (Lemke 1992; Wunderlin & Hansen 2011; Swearingen & Bargerion 2016; Weakley 2020; CABI Invasive Species Compendium 2021; California Invasive Plant Council 2021; Invaders of Texas/Texas Invasives 2021; UF, IFAS, Center for Aquatic and Invasive Plants 2021). *Schinus terebinthifolia* is a shrub or small tree to ca. 9 meters tall that is native to Argentina, Brazil, and Paraguay. It was introduced into the USA in the 1800s as an ornamental for its showy and profuse production of bright red fruits.

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