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# Occurrence of Hybrid Honey Locust (*Gleditsia x texana* Sarg.) in Southwest Arkansas

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The genus *Gleditsia* (Fabaceae) is represented in the United States by two distinctive species and a putative hybrid between them. The most widespread is honey locust, *G. triacanthos* L., with a natural range centered on the Mississippi drainage basin (Little, 1971) and common throughout Arkansas. It is characterized by long pods with a sweet pulp—the "honey"—between the many seeds. Water locust, *G. aquatica* Marsh., occurs in swamps and wet bottomlands on the Atlantic and Gulf Coastal Plains and in the Mississippi and Ohio River valleys. Smith (1988) indicated the distribution in Arkansas to be in the Mississippi Delta and West Gulf Coastal Plain divisions. It is characterized by short pulpless pods, each with one or occasionally up to three seeds. The putative hybrid of honey locust and water locust has been designated *G. x texana* Sargent. It is known in relatively few, widely scattered sites where both putative parent species also occur. It is morphologically intermediate between the other two taxa, with the range in fruit length being the most striking characteristic. Sympatric occurrences of honey locust and water locust are fairly common in southern Arkansas, but the occurrence of the putative hybrid in Arkansas has been previously documented only for Lee County (Gordon, 1966; Smith, 1988). Here we report the occurrence of *G. x texana* in Clark County. We are grateful to Eric Davis for his help with field collections.

After compiling an initial catalog of the woodland trees of Clark County, Arkansas, which listed both *Gleditsia triacanthos* and *G. aquatica* (Marsh 1986), DLM began searching for the hybrid in sites where both the species were found. Honey locust was common throughout the county, and water locust was found scattered in the Ouachita and Little Missouri River bottomlands.

On October 21, 1992, during a dendrology class field trip, a putative hybrid *Gleditsia* was found on the Ouachita River floodplain. The site was just north of Arkadelphia at the south boundary of the Caddo River Ranch (Clark Timberlands) in Section 5, Township 7 South, Range 19 West. The variable pods found on the ground by Smith, Marsh, and Davis indicated that the tree was *Gleditsia x texana*. Leaves and attached pods high in the tree could not be reached for collection on the day of discovery. Smith and Davis returned to the site on October 23 to collect leafy twigs with pods by shooting through the twigs with a rifle. Voucher specimens (Smith 75) were prepared for the Herbarium of Henderson State University. The tree was thornless, with a DBH of 21.5

cm. The height was estimated as about 12 m. The pods were variable in length (3.5-21.5 cm), shape (falcate or straight), and amount of pulp. All variations of fruit illustrated by Vines (1960) were present, and all characters which could be examined matched published descriptions of *Gleditsia x texana*. The tree was located in second growth, bottomland hardwoods. The area was rather poorly drained and occasionally flooded. Honey locust was common in the area, and a slough just to the east of the site provided the habitat suitable for water locust.

Additional field investigation yielded two more *G. x texana* individuals and two trees of problematical status. One of the hybrid honey locusts was near the first tree we had found; the other about a half mile to the north. Both were similar to the first in size and nearly thornless. The last was growing beside a very thorny honey locust, about the same size. The area between the first two trees and the third is swampy and seems likely to yield additional specimens with further search during the next growing season.

The two problematical trees were found a short distance north of the original site on the eastern edge of the Caddo River Ranch. The first was a honey locust with unusually narrow pods. Many pods were still on the tree, but only two could be collected. They were about 30 cm long and somewhat falcate, but without the corkscrew twist characteristic of dried honey locust fruits. The pods were flat and devoid of pulp. The other aberrant tree had a broad crown retaining many dried fruits, more than any other tree we observed in early March. Pods on different limbs were of different lengths, from less than 15 cm up to 35 cm. Some pods were curved and appeared to have pulp. The tree appeared to be thornless throughout.

Several trees found on the sloughs were tentatively identified as water locusts, but no pods were present for confirmation. (The presence of water locusts was confirmed the following growing season.) Common honey locust occurred throughout the area, especially on better drained sites, many still retaining typical pods.

Vines (1977) described what seemed to be an extensive hybrid population of "Texas locust" at the type locality in the Brazos River bottomlands near Brazoria, Texas. His description of intergrading variability certainly seems to correspond to the patterns found in hybrid plant populations which were described by Anderson (1949), and raises the question of the role of introgressive hybridization in the evolution of the Texas population. Anderson

(1949, p. 62-63) discussed the probable importance of introgression in producing the genetic variability characteristic of river-valley plants. A hybrid population such as that which may occur on the Brazos River provides a natural laboratory for the study of the role of introgression in biological evolution. Our preliminary findings suggest the possibility of such a population on the Ouachita River in Arkansas. Discovery of the two aberrant trees also raises interesting questions. Do these represent only minor variations of *Gleditsia triacanthos*, or might they be products of introgression between *G. triacanthos* and *G. aquatica* closer to *G. x texana*? We look forward with great interest to further investigations of the honey locust relatives of the Ouachita River floodplain.

As we reviewed the literature we found that Demaree (1943) had listed *Gleditsia texana* (without the hybrid designation) in his catalog of the vascular plants of Arkansas, citing Branner and Coville (1891) as the source. We noted with interest that this source antedated the original description of *G. texana* by Sargent (1901). Evidently Demaree recognized that the item which Branner and Coville (1891) listed as "*Gleditschia trachanthos* var. *brachycarpus*, Michx.; Nuttall" corresponded to Sargent's *G. texana*. A detailed study of the literature indicated that the hybrid honey locust was first found in Arkansas in 1819 by Nuttall (1821), some 80 years before Sargent found it in Texas. A full review of the relative literature will appear in the next *Academic Forum* published at Henderson State University.

Sargent (1922) listed only Texas, Louisiana, Mississippi, and Indiana as locations for *G. x texana*, and Vines (1960, 1977) gave only the same four states for the range. So far as we can find the first source after Demaree (1943) to include Arkansas in the range of *G. x texana* was the revision by Gordon (1966). Isely (1975) added north Florida and South Carolina to the range, designating it as "sporadic and rare". Vines (1960, 1977) and Robertson and Lee (1976) are among the modern authors who state that the hybrid honey locust was first discovered in Texas, ignoring the earlier listings in Arkansas. Although Vines adopted "Texas honey-locust" as the English name for the hybrid species, we prefer hybrid honey locust as the designation. Most modern authors consider the entity to be a hybrid species and place the "X" symbol in the binomial (Vines, 1960, 1977; Gordon, 1966; Isely, 1975; Robertson and Lee, 1976).

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