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Negundo Chaste Tree (*Vitex negundo* L.) (Verbenaceae): New to the Arkansas Flora

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Negundo Chaste Tree (*Vitex negundo* L.) (Verbenaceae)

New to the Arkansas Flora

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Non-native plant species are both accidentally and intentionally being introduced into the United States, including Arkansas. Of these species, many never become established in the flora, or if establishment occurs, many do not seriously threaten native plant species (Williamson 1996). However, numerous non-native plant species have become invasive subsequent to establishment, and many of the most invasive plants are escaped ornamentals, such as *Lonicera japonica* Thunb. (Japanese honeysuckle) and *Ligustrum sinense* Lour. (Chinese privet). Invasive species can alter native habitats and

ecosystems and often seem to reduce native biodiversity (D'Antonia and Vitousek 1992, Daehler and Strong 1994, Wilcove et al. 1998). About 23% of the Arkansas flora consists of non-native species (Arkansas Vascular Flora Committee 2006).

Vitex negundo L. (negundo chaste tree, Fig. 1), another non-native ornamental species, is reported here as new to the Arkansas flora. The genus *Vitex* has been traditionally treated as a member of the Verbenaceae family, and that designation will be followed for this manuscript (Arkansas Vascular Flora Committee 2006). It is important to note, however, that there is evidence to indicate that *Vitex* may be more closely allied to certain members of the Lamiaceae family (Cantino 1992). *Vitex negundo* is a large deciduous shrub or small tree that grows to a height of 8 or 9 meters. It is native to Europe, Asia, and possibly portions of northern Africa (Bailey and Bailey 1976, Krüssmann 1977, Griffiths 1994). In addition to Arkansas, *V. negundo* has been documented to occur spontaneously in Florida, Louisiana, Maryland, Ohio, Oklahoma, and Texas (USDA, NRCS 2007).

Five botanically recognized varieties of this species occur (Flora of China Editorial Committee 1994). Apparently, three of these: *V. negundo* L. var. *negundo*, *V. negundo* L. var. *cannabifolia* (Sieb. and Zucc.) Hand.-Maz., and *V. negundo* L. var. *heterophylla* (Franch.) Rehd., are all spontaneous in Arkansas to various degrees (spontaneous is here defined as the autonomous occurrence through sexual or asexual reproduction of a non-native plant species in a region or flora to which it is not native). Spontaneous plants of *V. negundo* in Arkansas were observed in the vicinity of one or more cultivated plants of the species. Varieties *negundo* and *cannabifolia* have been observed spontaneous in large numbers in Garland and Clark counties, respectively, whereas only a few spontaneous seedlings of variety *heterophylla* have been observed in Clark County. See identification key at end of manuscript for distinguishing the varieties of *V. negundo*.

Vitex negundo (variety *negundo*) has been documented from Garland County [Serviss 7098, Henderson State University (HEND)]. The Garland County location had a large spontaneous population estimated to be between 100 to 300 plants, in which individuals ranged in development from seedlings to small shrubs (some shrubs were reproductive with flowers and/or mature fruits). Spontaneous plants in this population were present in high densities along several meters of a roadside where they appeared to be offspring of a large tree of the species present at the location. The origin of this putative founder plant is unknown, but the Garland County location is adjacent to a home site and

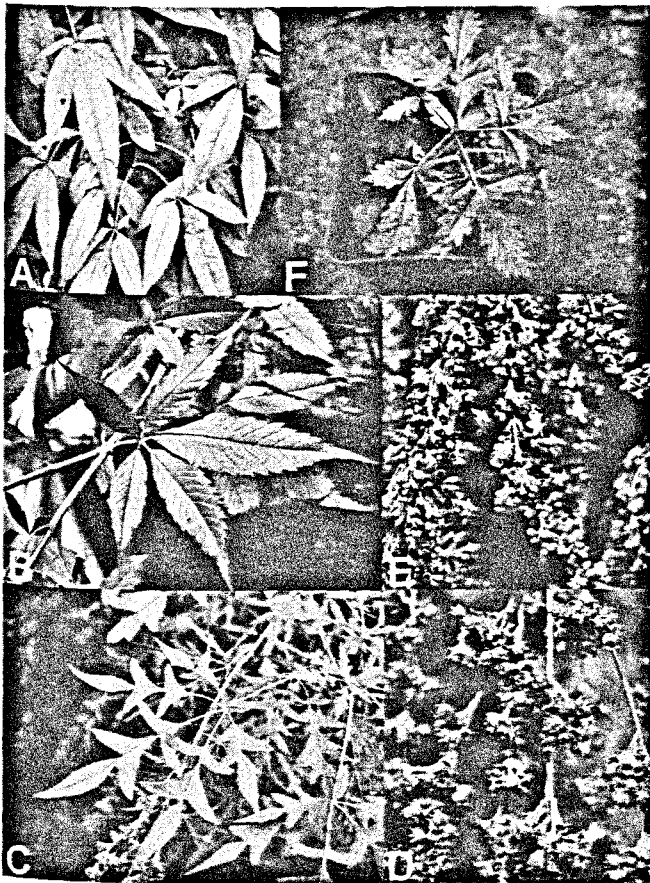


Fig. 1. Photos of *Vitex negundo* L. A. Leaf of var. *negundo*. B. Leaf of var. *cannabifolia*. C. Leaf of var. *heterophylla*. D. Fruits. E. Flowers. F. Juvenile.

residential area; thus the putative founder *V. negundo* plant may be persisting from cultivation. There were also numerous spontaneous plants present in the area immediately adjacent to the roadside. The habitat of the entire Garland County location consisted of disturbed open, forest edge, and partially wooded areas. No plants were observed within wooded areas that had dense canopy cover.

Vitex negundo has also been observed and collected in Baxter, [P. Hyatt 2006.03, University of Arkansas (UARK)], Drew [E. Sundell 7689, University of Arkansas at Monticello (UAM)], Lincoln (F. Baldwin s.n., UARK), Miller (R. Stuckey 25, UARK), Pulaski (B. Shepherd 449, Herbarium of the Arkansas Natural Heritage Commission), and Yell [B. Baker 2572, University of Central Arkansas (UCAC)] counties. The plants from Baxter, Miller, Pulaski, and Yell counties were unequivocally spontaneous and not cultivated. The Yell County specimen was collected from a spontaneous population of 5 plants, which were apparently offspring of 6 mature cultivated shrubs growing along a fencerow between an old home site and an adjacent pasture. The offspring were observed growing

in the yard of the old home site, the pasture, and adjacent fencerow, all within 15 meters of the parent shrubs. Some of these spontaneous offspring were reproductively mature. The Pulaski County location had numerous spontaneous plants of *V. negundo*; these apparently escaped from cultivated plants at that location. Another species of *Vitex*, *V. agnus-castus* L. (see final section), was also spontaneous at the Pulaski County location.

Vitex negundo appears to be aggressive with regard to its ability to successfully produce large numbers of offspring with subsequent establishment and spread into new areas. Establishment by *V. negundo* can occur from only a single, isolated founder plant because of its ability to self-pollinate.

Vitex negundo is morphologically similar to *Vitex agnus-castus* L. (lilac chaste tree, Fig. 2), which is naturalized in Arkansas. The following key can be used to distinguish *V. negundo* from *V. agnus-castus*. A separate key, immediately following the *Vitex* species key, is also provided in order to distinguish the 3 varieties of *V. negundo* that are currently known to occur in Arkansas outside of cultivation. It is important to note that juveniles of both species and all three varieties of *V. negundo* have coarsely toothed leaflets making species and varietal identification more difficult with juvenile plants.

Key to species of *Vitex* in Arkansas:

1. Leaflets almost always entire (occasionally, a single tooth is present on a few leaflets); inflorescence tightly clustered with flowers or fruits, erect; fruits 3 to 4 mm in diameter. *V. agnus-castus*
1. Leaflets coarsely toothed or deeply lobed and lacinate (sometimes leaflets may be mostly entire with one to a few coarse teeth); inflorescence somewhat loosely flowered, often drooping; fruits about 2 mm in diameter *V. negundo*

Key to varieties of *V. negundo* in Arkansas:

1. Leaflets at most with only one to a few teeth (juvenile or small plants of this variety can have coarsely toothed leaflets) *V. negundo* var. *negundo*
1. Leaflets coarsely and regularly toothed or deeply lobed
 2. Leaflets coarsely toothed *V. negundo* var. *cannabifolia*
 2. Leaflets deeply lobed *V. negundo* var. *heterophylla*

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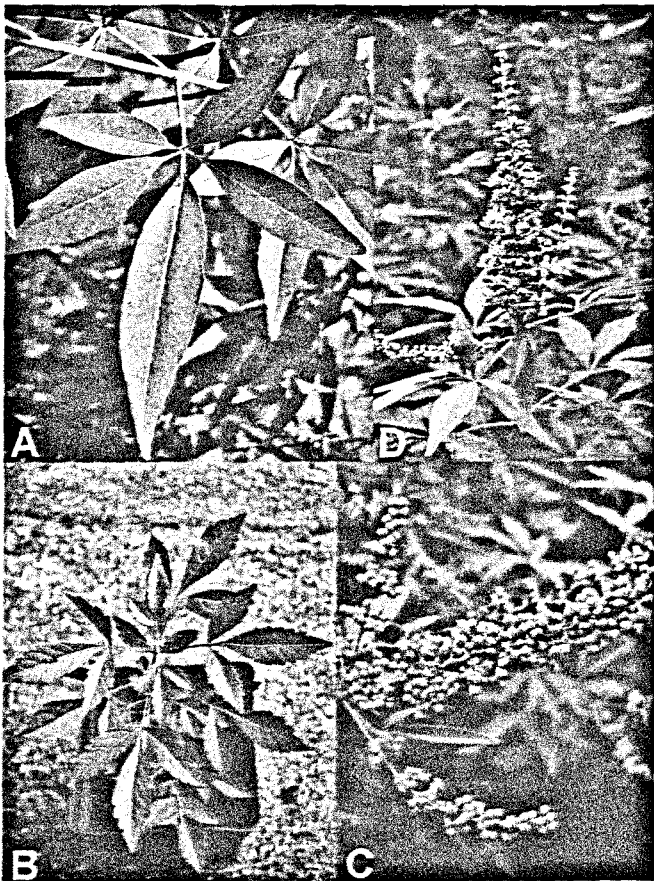


Fig. 2. Photos of *Vitex agnus-castus* L. A. Leaf. B. Juvenile. C. Fruits. D. Flowers.

Literature Cited

- Arkansas Vascular Flora Committee.** 2006. Checklist of the vascular plants of Arkansas. Fayetteville (AR): Arkansas Vascular Flora Committee, University of Arkansas. 216 pp.
- Bailey LH and EZ Bailey.** 1976. Hortus Third. A concise dictionary of plants cultivated in the United States and Canada. Vol. 2. Cornell University. New York: MacMillan. 1290 pp.
- Cantino PD.** 1992. Evidence for a phylogenetic origin of the Labiatae. *Annals of the Missouri Botanic Garden* 79:361–379.
- Daehler CC and DR Strong.** 1994. Native plant biodiversity vs. the introduced invaders: Status of the conflict and future management options. In: SK Majumdar, FJ Brenner, JE Lovich, JF Schalles, and EW Miller, editors. *Biological diversity: Problems and challenges*. Easton (PA): Pennsylvania Academy of Science. p. 92–113.
- D'Antonia CM and PM Vitousek.** 1992. Biological invasions by exotic grasses, the grass/fire cycle and global change. *Annual Review of Ecology and Systematics* 23:63–87.
- Flora of China Editorial Committee.** 1994. *Flora of China*. Vol. 17 (Verbenaceae through Solanaceae). Beijing (China): Science Press, and St. Louis (MO): Missouri Botanical Garden Press. p. 28–31.
- Griffiths M.** 1994. *Index of garden plants*. Portland (OR): Timber Press. 1234 pp.
- Krüssmann G.** 1977. *Manual of cultivated broad-leaved trees and shrubs*. Vol. 3. Portland (OR): Timber Press. 445 pp.
- USDA, NRCS.** 2007. The PLANTS Database. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Available at <http://plants.usda.gov>. Accessed on 29 January 2007.
- Wilcove DS, D Rothstein, D Dubow, J Phillips, and A Losos.** 1998. Quantifying threats to imperiled species in the United States. *Bioscience* 48:607–615.
- Williamson MH.** 1996. *Biological invasions*. London: Chapman and Hall. 244 pp.