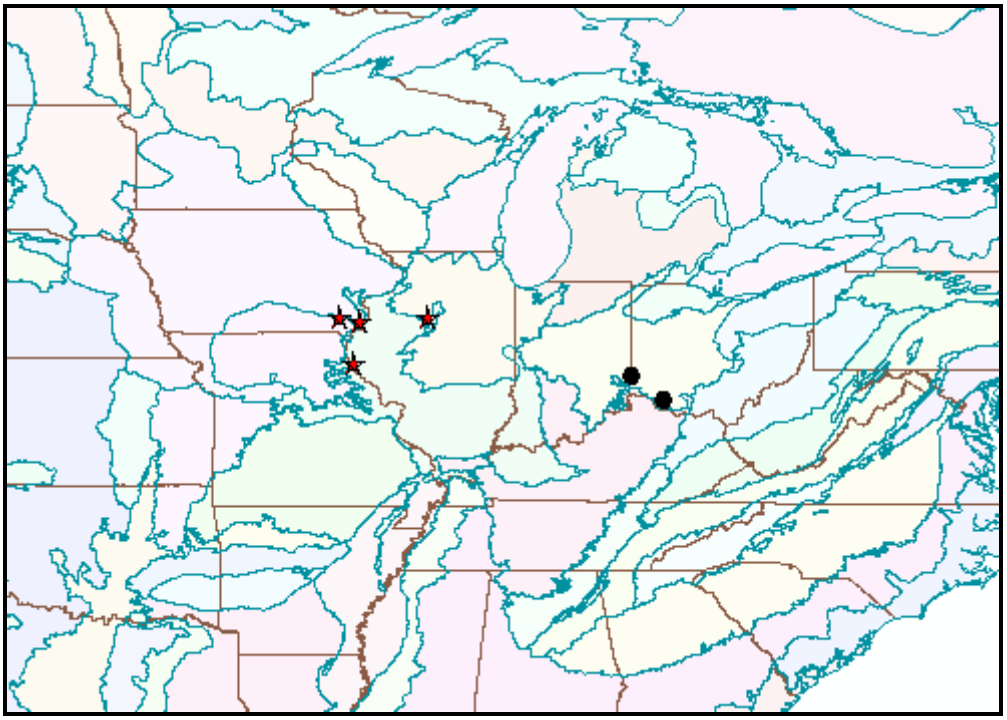
2010 NCRPIS *Viburnum molle* Seed Collections

USDA United States Department of Agriculture

NPGS *Viburnum molle* Sites



● Past accessions

★ 2010 accessions

Cover: Image of *Viburnum molle* leaf at “Highbanks Area” of Hueston Woods State Park (39.5529°N, 84.73361°W) – Butler Co., IL.

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Introduction

The USDA-ARS Plant Introduction Station (Ames, IA) completed a collection trip to areas in Iowa and Illinois in 2010. Participants included:

- **Jeffrey D. Carstens**, Agricultural Science Research Technician, USDA-ARS Plant Introduction Station, Ames, IA (left)
- **Andrew P. Schmitz,** Horticulturist, Brenton Arboretum, Dallas Center, IA (right)

The objectives were to:

- Identify and collect *Viburnum molle* populations and potentially other NPGS genera in Iowa and Illinois in 2010
- Store and backup seed collections at the USDA-ARS Plant Introduction Station and the National Center for Genetic Resources Preservation in Fort Collins, Colorado, respectively
- Ultimately, conserve representative genetic diversity of *Viburnum molle* germplasm

Importance of *Viburnum molle* Conservation

Viburnum molle Michx., commonly known as softleaf arrowwood, is a native shrub that occurs from southeastern Iowa south to Mississippi and from Oklahoma east to New York. It is most commonly found on very steep (60% or greater), eroding forest slopes, but also occurs as an understory species in wooded floodplains. *Fraxinus quadrangulata* is typically noted as an associate, indicative of limestone as a common substrate. We typically found *V. molle* growing on gravelly substrates. We are unsure whether this species actually prefers steep-sloped habitats or if it can simply outperform potential competitors under these conditions. We also noted that steep slopes where we found *V. molle* generally seem to support greater biodiversity. This could be the result of reduced animal foraging or the inability for invasive species to successfully establish.

Ornamental characteristics of *V. molle* include showy white flowers borne on 3 inch cymes, purple/black fruits, dark-red fall color, and exfoliating bark. Growth habit is somewhat open and loose, similar to *V. dentatum.* Mature specimens can reach 15'-20' tall. It is an interesting woody ornamental that seems to be fairly uncommon throughout the central and south-central Midwest, represented by small, localized populations that are widely dispersed. Currently this species is state-listed as threatened in Illinois and Kentucky, endangered in Ohio, and rare in Indiana. Given its rarity, well-conserved *ex situ* germplasm collections are warranted to help conserve it. Preserving a significant number of these populations would be required for successful long-term conservation and reintroduction.

Collection Trip Plan

Monday, 30 August 2010
Oakland Mills County Park – Henry Co., IA; Senachwine Creek – Peoria Co., IL; Beebee Creek – Pike Co., IL

Tuesday, 31 August 2010
Burton Creek – Adams Co., IL; Shimek State Forest – Van Buren Co., IA

Monday, 4 October 2010
Starr's Cave State Preserve – Des Moines Co., IA

Collection Trip Daily Log

Monday, 30 August 2010

Oakland Mills County Park in Henry County, Iowa was originally targeted and harvested (Ames 27281) by Mark P. Widrlechner in 2003. However, the quantity of seed harvested was low. A revisit to this location resulted in the harvest of additional seeds. Fruits were ripe (purplish/black in color) and ready to be harvested. Due to the extreme amount of plant Competition/shading, flowering and seed production was limited. Approximately 100-200+ mature plants were noted along the Skunk River on a north-northeast facing slope (70%). Associated taxa included *Carpinus caroliniana, Cornus alternifolia, Ostrya virginiana, Quercus imbricaria, Quercus rubra, Tilia americana, Toxicodendron radicans,* and *Vitis riparia.* We sampled a total of 8 plants.

Areas around Senachwine Creek in Peoria County, Illinois were targeted because of findings reported in an element occurrence and sighting report prepared by William C. Handel in 2000. A large quantity of seed was harvested from approximately 35 individuals. An extensive population of 300+ plants was found along the steep (75%), west-northwest facing slopes along Senachwine Creek. Associated flora included *Cornus* sp., *Fraxinus* sp., *Ostrya virginiana, Platanus occidentalis, Quercus rubra, Staphylea trifolia, Tilia americana,* and *Vitis riparia.*

Exploration in areas around Beebee Creek in Pike County, Illinois was limited due to multiple landowners denying permission to access property. One area that was explored resulted in finding approximately 50 specimens. Unfortunately, shading from large trees was so severe that flowering/fruit production did not occur. Additional exploration along other areas of Beebee Creek with extreme elevation changes will most likely result in finding additional specimens of *V. molle.*

Tuesday, 31 August 2010

Slopes along the Burton Creek Watershed in Adams County ,Illinois were home to numerous specimens of *V. molle.* Fruit production was present, but limited. Again, steep (80%), northeast and north-northwest facing slopes supported approximately 150+ specimens scattered throughout a 2-mile stretch along Burton Creek. Associated flora included *Cornus alternifolia, Fraxinus americana, Fraxinus quadrangulata, Ostrya virginiana, Quercus muhlenbergii, Quercus rubra, Sanguinaria canadensis, Staphylea trifolia, Tilia americana,* and *Vitis riparia.* A total of 13 plants were sampled.

Collection Trip Daily Log

Tuesday, 31 August 2010 (cont'd)

Herbarium records at the Ada Hayden Herbarium indicated the presence of *V. molle* growing in Shimek State Forest in Des Moines County, Iowa. A couple specimens of*Viburnum* sp. (identification to the species level was questionable) were noted growing in the understory. Leaves seemed to be quite small and exfoliating bark was barely noticeable. Compared to other *V. molle* habitats, this area had soils high in organic matter on moderate slopes (20-30%). It is unsure if the plants found are the same as the herbarium specimen listed as *V. molle.* Additional exploration is needed to find areas where plants are not being shaded in order for seed production to occur.

Monday, 4 October 2010

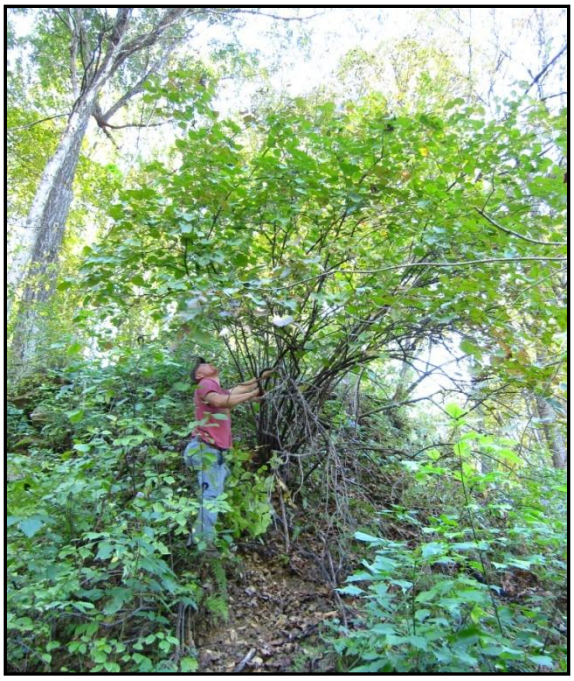
Starr's Cave State Preserve in Des Moines County, Iowa has a variety of different habitats. *Viburnum molle* at this location was most common on very steep (80%), north-facing slopes. A few additional, scattered specimens were also noted on south and southwest-facing slopes and in floodplain areas. Associated flora included *Cornus racemosa, Cornus alternifolia, Fraxinus quadrangulata, Lonicera japonica, Lonicera maackii, Morus rubra, Physocarpus opulifolius, Platanus occidentalis, Ptelea trifoliata, Quercus alba, Quercus muhlenbergii, Staphylea trifolia,* and *Tilia americana.* Although 100+ mature specimens were noted, only fruits from two specimens were harvested. Due to severe shading, the ability for this species to regenerate may be limited. An additional seed harvest should be targeted in order to attain better genetic representation of the population.

Trip Summary

In total, 3 new accessions of *Viburnum molle* were obtained. One accession (Oakland Mills County Park) was reobtained.

It is suggested that if future *V. molle* harvests are planned, optimum timing for fruit maturity would be in mid-August. Since fruits are most likely preferred by birds, delaying harvest after September 1st could be problematic.

Other than *V. molle*, seeds of *Fraxinus quadrangulata* were sampled along Burton Creek and Starr's Cave State Preserve and included into the NPGS *Fraxinus* collection.



Viburnum molle – Starr's Cave State Preserve

After seeing the habitats that generally support *Viburnum molle,* it is unclear what allows this species to persist in these isolated settings. Invasive species may lack a competitive advantage under steep-sloped habitats that typically support *V. molle.* It is unclear if nursery plantings of *V. molle* grown in a "normal" habitat will successfully establish and compete with other woody species. Generally, our observation of gravelly substrates on steep slopes would suggest that this species is drought tolerant and adapted to good drainage. Therefore, planting this species in soils high in organic matter with high water retention may result in poor establishment. Another factor that is reducing the ability for this species to regenerate is a seed-infesting insect. Numerous observations have shown small exit holes on cleaned seeds. Additional research on this most-likely undescribed insect is needed.

List of Germplasm Collected

TAXON	ACCN	LOCALITY
Fraxinus quadrangulata	Ames 30589	Adams County, Illinois
Fraxinus quadrangulata	Ames 30687	Des Moines County, Iowa
Viburnum molle	Ames 27281	Henry County, Iowa
Viburnum molle	Ames 30591	Peoria County, Illinois
Viburnum molle	Ames 30592	Adams County, Illinois
Viburnum molle	Ames 30691	Des Moines County, Iowa