

# APCRP: Investigations into the water chestnut - Genetics and ecology

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## Capability

A suspected introduction of a new invasive aquatic plant, water chestnut (*Trapa* sp.) has been discovered in the freshwater reaches of the Potomac River (and other areas within the same watershed) in the Commonwealth of Virginia (Figure 1). This water chestnut species presents with a two-horned fruit as opposed to the typical four-horned fruit associated with the *Trapa natans* (Figure 2). Because of past and present significant infestations of the *Trapa natans* in the northeastern U.S., and with other states not currently supporting populations of water chestnut listing this species as noxious and/or prohibited, further investigation into this new infestation is warranted. The U.S. Army Corps of



Figure 1: Water chestnut (*Trapa* sp.) is an exotic, invasive floating-leaved aquatic plant that requires management in the northeastern U.S. *Trapa natans* infested the Potomac River in the early 1920s requiring extensive mechanical control operations by the US Army Corps of Engineers.

Engineers (USACE) Aquatic Plant Control Research Program (APCRP) is currently funding research investigating the genetics and ecology of the *Trapa* species (water chestnut). Three objectives to complete this work are: 1) to determine the extent of morphological and genetic differences of water chestnut populations in the northeastern U.S., 2) to determine the invasiveness, via competition, of a potential new introduction of water chestnut with regards to other submersed aquatic vegetation (SAV), specifically native American eelgrass (*Vallisneria americana* Michx.) and non-native, invasive *monoecious hydrilla* (*Hydrilla verticillata* L.f. Royle), and 3) to determine whether

depth (light availability) affects the germination and growth of this potential new introduction of water chestnut.

## Applications

Results of this study will provide the guidance necessary to develop and maintain effective, sustainable management plans for this potential new introduction of water chestnut. Through the study of this invasive aquatic species' genetics and ecology, biocontrol and herbicide control options will be evaluated to limit the potential spread and impacts on native aquatic plants and animals. Additional benefits of the study include public access to waters for recreational and sport activities, improved water quality, prevention of invasive species spread, and protection of quality aquatic habitat.

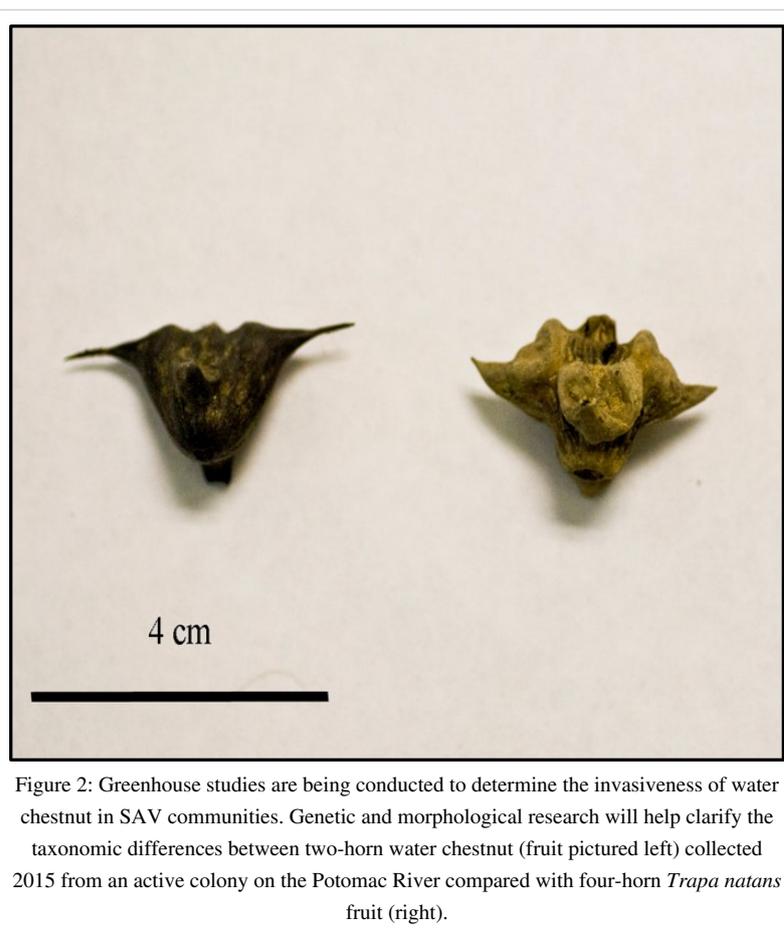


Figure 2: Greenhouse studies are being conducted to determine the invasiveness of water chestnut in SAV communities. Genetic and morphological research will help clarify the taxonomic differences between two-horn water chestnut (fruit pictured left) collected 2015 from an active colony on the Potomac River compared with four-horn *Trapa natans* fruit (right).

## Status

This APCRP work unit is on-going and this project is funded FY16–18. Additional support is provided by USACE Baltimore District for this project.

## Principal Investigator (PI)

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# Article Sources and Contributors

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