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# Flowering Dogwood Survives Exotic Attack

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# Flowering Dogwood survives exotic attack

Article and illustration by W. John Hayden, Botany Chair

It has been said that loss of native biodiversity from the effects of invasive exotic species is second only to that caused by outright habitat destruction. In the world of plants, some of the worst offenders are exotic species that actively invade intact natural habitats and, by their aggressive tendencies, crowd out native species. Attack by lianas (woody climbing plants) such as Japanese Honeysuckle (*Lonicera japonica*) and Oriental Bittersweet (*Celastrus orbiculatus*) can include effects similar to strangulation, brought on by twining around their host plant's stems. It is not always the host, however, for which the outcome is negative in these life-or-death struggles between native tree and exotic liana. The Flowering Dogwood stem illustrated here (Figure 1) shows an example in which Japanese Honeysuckle lost the battle. The small helixlike stems below and above the middle of the photograph are from a dead honeysuckle (labelled H), and the larger, branched, stems are dogwood. Above both of the coiling honeysuckle stem segments, profuse overgrowth of dogwood is evident, especially in the upper example.

Here is my interpretation of the dynamics that played out here. A young Japanese Honeysuckle stem grew quickly up this small dogwood trunk, forming a left-handed helix pressed closely to the dogwood bark. Soon, the honeysuckle stem began to undergo secondary growth, i.e., its cambium began to make new xylem and phloem cells, causing the honeysuckle stem to become thicker and, in effect, tightening its grip on the dogwood. The constriction got only tighter, because the dogwood, too,

has a cambium, which also makes its bark thicker. At some point, as the two stems tightened their grip on each other, the honeysuckle began to disrupt cambial growth and, consequently, normal physiological processes in the dogwood stem. This could have been the beginning of the end for the dogwood.

Any healthy photosynthetic plant must continuously transport some of the sugar made by photosynthesis in its leafy canopy down to the roots in order to keep its root cells alive—but the tightly wrapped honeysuckle stem had limited the dogwood's ability to make the phloem cells required for this downward flow of sugars. Consequently, sugars built up in the unrestricted dogwood phloem directly above the constricting honeysuckle stem. This excess sugar stimulated even more growth by the cambium—so much growth, in fact, that dogwood tissues completely overgrew the honeysuckle stem in the two places illustrated. Simply put, in this case, the dogwood grew faster and won. Of course, too often, it goes the other way, and the Japanese Honeysuckle (or Oriental Bittersweet) kills the native plant (dogwoods included) upon which it grows because the constricted host stem can no longer keep its root cells alive. There is, nevertheless, a certain satisfaction in noting this one particular case in which the native plant came out ahead. ❖

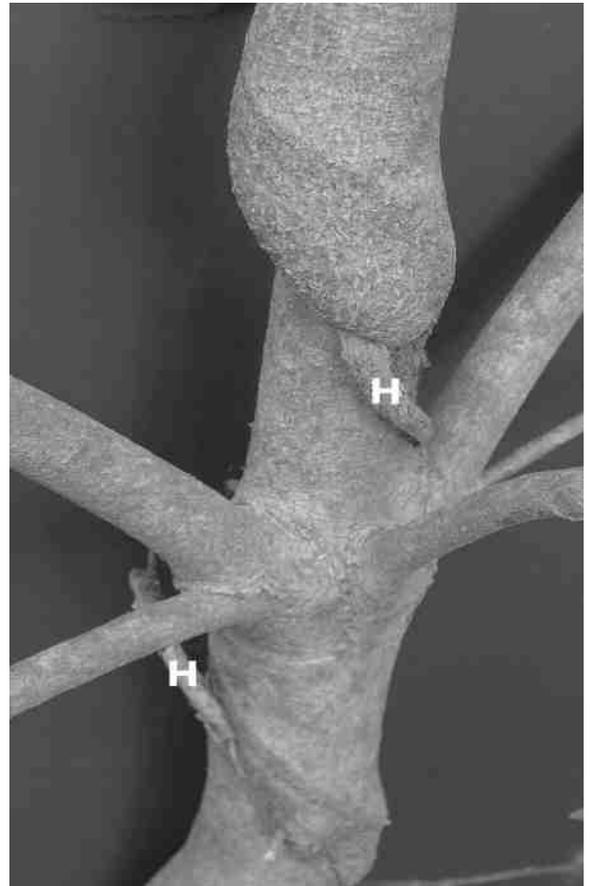


Figure 1. Branched Flowering Dogwood stem (*Cornus florida*) that survived constrictive effects of a twining Japanese Honeysuckle (*Lonicera japonica*) liana (H).



## VIRGINIA NATIVE PLANT SOCIETY

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