

Japanese Cedar Longhorned Beetle in the Eastern United States

The Japanese cedar longhorned beetle, *Callidiellum rufipenne* (Motschulsky) (Coleoptera: Cerambycidae), is a wood-boring beetle of East Asian origin that was first detected in North America in 1927 at Vancouver, BC, and in 1954 at Seattle, WA. It was discovered again, this time in the Eastern United States, in May 1997 at Manteo, NC (Dare Co.). Larvae were reared from dead eastern redcedar (*Juniperus virginiana*).

Recently, at several nurseries in Connecticut, *C. rufipenne* has been found in American arborvitae (*Thuja occidentalis*, also known as northern whitecedar). This plant material consisted of the variety 'Emerald Green' and ranged in height from 3 to 9 feet.

In its native range, the Japanese cedar longhorned beetle is considered a secondary pest because it preferentially attacks only weakened or freshly felled conifers. Although not formerly known to attack or complete normal development in healthy trees, this wood-boring beetle has developed in more than 40 apparently healthy arborvitae at the Connecticut nurseries.

Identification Characteristics

The genus *Callidiellum* is comprised of three species in North America: the native *cupressi* from coastal California and *viridescens* from Arizona, and the introduced *rufipenne*. One additional species, *C. villosulum*, is found in eastern China.

In North America, *Callidiellum* is easily distinguished from the closely related genus *Semanotus* by the principal segment of the legs (femora) being strongly and gradually thickened toward the tip, by the antennae being slender and cylindrical with the second segment elongated, by the dorsal surface of the prothorax (pronotum) being weakly or sparsely punctate, and by the pronotum having a pair of feebly developed and thickened elevations or swellings (callosities), one on each side of the midline.



Adult male (left) and female (right) on bark surface of cut log of arborvitae.

Adults of *C. rufipenne* are moderate sized, robust, somewhat depressed, and 6–13 mm long. They have hardened anterior wings (or elytra) that are coarsely punctate. The male is black with reddish humeri (basal angles or shoulders of the elytra); the female has reddish or testaceous elytra.

Larvae of *C. rufipenne*, up to 18 mm long when fully mature, are robust and flattened with three pairs of very short but distinct legs on the undersurface of the thorax.

Distribution and Interceptions

Callidiellum rufipenne is endemic to East Asia, occurring in China, Korea, Sakhalin, Japan, and the Ryukyu Islands (Oshima, Okinawa). It is also recorded from Taiwan, where it is thought to have been accidentally introduced. This species is also adventive in New Zealand, Italy, and Spain. It was accidentally introduced into Italy on timber imported from eastern Asia and has become established on common juniper (*Juniperus communis*).

During 1973 through 1987, *C. rufipenne* was frequently intercepted at U.S. ports of entry in primarily Japanese cedar (*Cryptomeria japonica*) dunnage. From 1978 through 1983 alone, 213 U.S. interceptions were recorded for this longhorned beetle. However, since this was a secondary pest thought to disturb only dead or dying wood, plant health officials deemed no additional quarantine or regulatory measures necessary.

The North American range of *C. rufipenne* has not been determined.

Biology

In central Japan, *C. rufipenne* completes one generation annually. Adults emerge from dead host trees in the spring (early to mid-April) and mate on the surface of the trunks of weakened or dead Japanese cedars. Females lay eggs in bark crevices. The approximate lifespan of adult males and females is 18.0 and 16.6 days, respectively. The majority of females (65 percent) will begin to lay eggs as soon as 1 to 3 days after emergence. Females lay an average of 18.1 eggs over a 14-day period after emergence. Most emerging adults fly to host trees in middle April and generally disappear by late May.

Although most species of cerambycids require some feeding after winter emergence to ensure egg maturation and oviposition, female *C. rufipenne* apparently can lay eggs without feeding. Females contain matured eggs upon emergence. Newly hatched larvae enter the bark, construct shallow galleries, and feed just beneath the bark on the nutrient-rich phloem and cambium tissue. Fully mature larvae enter the xylem (wood) by late summer, construct pupal cells by autumn, and overwinter as adults. In early spring, adults emerge by chewing through the bark.



Extensive larval damage to arborvitae trunk.



Adult beetle (male) in pupal chamber.

Damage

The greater part of the larval period of *C. rufipenne* is spent boring between the bark and wood, where the larvae deeply score the underlying wood to form irregular galleries. Just prior to pupation, mature larvae bore straight into the wood of the host tree and construct long pupation chambers parallel to the grain. The entrance tunnels to these chambers are tightly packed with fine, powdery frass. Damage may not be evident on the exterior of infested trees until adults emerge from 4- x 2-mm oval exit holes in the spring.

Hosts

All species of *Callidiellum* are associated with coniferous trees of the taxodium and cypress families (Taxodiaceae and Cupressaceae, respectively). *Callidiellum rufipenne* has been recorded from the following hosts in its native geographic range: Japanese cedar (*Cryptomeria japonica* [L.f.] D. Don), Hinoki cypress (*Chamaecyparis obtusa* [Siebold & Zucc.]), Sawara cypress (*Chamaecyparis pisifera* [Siebold & Zucc.]), and false arborvitae (*Thujaopsis dolabrata* [L.f.] Siebold & Zucc.). In its introduced range, *C. rufipenne* has been found in eastern red cedar (North Carolina), American arborvitae (Connecticut), juniper (*Juniperus communis* L.) (Italy), and Monterey cypress (*Cupressus macrocarpa* Hartw.) (Spain). Firs (*Abies* spp.) and pine (*Pinus* spp.) have also been listed as hosts in Asia.



Mature larva in gallery.

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