



Oyster-Shaped Scales

Dawn Dailey O'Brien, Plant Pathology and Plant-Microbe Biology, Cornell University

You've seen the distinctive oyster-shape of scale insects on several different trees and shrubs and might have wondered, "are these all the same pest or not?" Given that some scales have multiple hosts and Japanese maple scale is showing up more frequently in the Northeast in the last 5 years or so, it's time we feature some of these peculiarly shaped pests that you're likely to encounter and discuss how to differentiate among and recognize them based on their appearance and hosts.

Scale insects in general damage plants by sucking plant fluids from stems, branches, and leaves using needle-like piercing-sucking mouthparts. Heavy infestations can cause leaf yellowing or premature leaf drop and branch dieback, decline, and distortion. They may even predispose plants to winter injury. Scale insects include several subgroups or families. The most common of these in the Northeast include armored, soft, felt, oak gall, and pit scales.

'Oyster-shaped scales' described here are all armored scales. Armored scales are distinguished by their hard, shell-like covers that easily separate from the insect beneath. They produce little or no honeydew. Adult male and female armored scales often are shaped and colored differently, so may not be recognized as the same type of insect. Armored scales are notorious for being difficult to control, well-defended as they are from effects of contact insecticides. They also have a reputation for being less susceptible to systemic insecticides, perhaps because they feed in parenchyma, rather than (like soft scale insects) in phloem. Generally armored scales are most vulnerable in the 'crawler' stage, soon after hatching from eggs. Physical removal of scales by careful 'power-washing' or using a soft brush for scales on bark can help in control, particularly where layers of dead scales build up and give added protection to the new generations beneath. The technique is now widely used by arborists and can even be done using plain water from a typical landscape sprayer.

Following are some of the more common oyster-shaped scales insects seen in our region:

Oystershell Scale (*Lepidosaphes ulmi*) (177)

Hosts: Wide variety of woody hosts especially apple, lilac, ash, willow, poplar and maple, and dogwood.

Description and Life Cycle: The female scale cover is 1/8 inch long, dark brown to gray banded (varies depending on host), and shaped like an elongated oystershell. The male has the same color and shape but is considerably smaller. Oystershell scales overwinter



Oystershell scale adult females on twig © Kent Loeffler

as whitish eggs underneath the female scale cover. The eggs hatch in late May through mid-June. The crawlers move around for a few hours, find a suitable location, settle, and begin to feed, never to move again. Within a week they form a protective waxy covering, protected from most insecticides. There is one generation per year.

Management: Prune out infested branches. April for dormant oil spray, 7–91 GDD₅₀. Treat crawlers in late May through mid-June (363–707 GDD₅₀). Several treatments may be required. The twice-stabbed ladybird beetle is an important predator.

Euonymus Scale (*Unaspis euonymi*) (186)

Hosts: In the Northeast, these scales are especially damaging to European euonymus (*E. europaeus*), wintercreeper euonymus (*E. fortunei*), and Japanese euonymus (*E. japonicus*). Winged euonymus (*E. alatus*), spreading euonymus (*E. kiautschovicus*), and American euonymus (*E. americanus*) are highly resistant or immune.

Many other species of plants including boxwood, bittersweet, *Daphne*, Russian olive, English ivy, holly, privet, honeysuckle, pachysandra, and some *Prunus* sp. are reported to be hosts. However, these other plants are most likely to become infested only when growing near unmanaged plantings of euonymus harboring large infestations of scales.

Description and Life Cycle: The female scale cover is 1/16-inch long, grayish-brown and oystershell-shaped. The males are smaller, white, long and thin. The females are usually found on stems and males are more often on leaves. Euonymus scales overwinter as fertilized females. In late April and May they begin laying eggs. The pale yellow crawlers hatch in early June and after a short time settle to feed. The crawlers usually mature into adults after four to six weeks. There is a second generation of crawlers by late July through August. Leaves usually show the most conspicuous evidence of infestation

Management: When establishing new plantings, select against highly susceptible species or use them judiciously. Egg-laying females and nymphs are particularly sensitive to applications of pesticides, and properly timed applications of a registered pesticide should reduce scale populations to acceptable levels. Treat in mid-April to early May (35–120 GDD₅₀) for dormant treatment. Treat in early June (533–820 GDD₅₀) for first generation crawlers and again in mid-July (1150–1380 GDD₅₀) for second generation crawlers.



Euonymus scale (brown females and white males) © Kent Loeffler

An introduced lady beetle, *Chilocorus kuwanae*, feeds on euonymus scales throughout the growing season and is an important biocontrol in areas where it is established.

Winged Euonymus Scale (*Lepidosaphes yanagicola*) (186)

While the burning bush shrub (*Euonymus alatus*) is quite resistant to the euonymus scale (*Unaspis euonymi*), it is host to a smaller, similar species called the winged euonymus scale or yanagicola oystershell scale (*Lepidosaphes yanagicola*).

Hosts: Mainly burning bush euonymus (*E. alatus*). Ash, basswood, elm, lilac, maple and willow are also reported hosts.

Description and Life Cycle: Small ($1/16$ " or 2 mm long), narrow, brown to gray, oystershell-shaped waxy covers often found on the twigs between 'wings' of burning bush. In heavy infestations scales may also be found near leaf midveins. These scales are much thinner than oystershell scale. It overwinters as either as eggs or partially mature scales. In the mid-Atlantic region, eggs are white and produced from late May to early June, with white crawlers hatching in late June through July. Timing would likely be around 10–14 days later for New York. This scale has one generation per year.

Management: Treat when crawlers first appear—see Cornell Guidelines for options. Repeat application if needed due to long crawler hatch period.



Winged euonymus scale (AKA yanagicola oystershell scale) © Dan Gilrein

Japanese Maple Scale (*Lopholeucaspis japonica*)

Japanese maple scale started appearing in southeastern NY just a few years ago. Though first reported from CT in 1914, it now appears to be spreading and reports are on the rise.

Hosts: Commonly on Japanese maple, holly, privet and autumn olive. The host range is very wide including many of our popular woody ornamentals (*Amelanchier*, *Cercis*, *Cornus*, *Cotoneaster*, *Euonymus*, *Fraxinus*, *Gleditsia*, *Itea*, *Magnolia*, *Malus*, *Prunus*, *Pyracantha*, *Pyrus*, *Salix*, *Stewartia*, *Styrax*, *Syringa*, *Tilia*, *Ulmus*, *Zelkova* among others).

Description & Life Cycle: These are tiny (about 1–2 mm long), greyish-white, narrow oyster shell-shaped creatures that settle on bark of various deciduous trees. The scale is somewhat unique in being 'pupillarial,' i.e. a shiny brown pupa-like 'shell' beneath is revealed when the outer white waxy cover is gently rubbed off. They are easily overlooked until populations get very high. They blend in well with the bark but once pointed out become much easier to see. They are usually on bark but can also be on foliage. The eggs and other stages are a distinct purple color making field ID fairly easy.

Information from Maryland notes two generations a year, with immature scales overwintering. In Pennsylvania eggs first appear in mid-June and crawlers hatch in late June, or 795 GDD (accumulations starting Jan. 1), peaking around 1144 GDD. Figures for the second generation were 2220 and 3037 GDD, respectively.

Management: For heavy infestations, first try removing many with a water 'power-wash' or soft brush off taking care not to damage bark. Treatments for crawlers are listed in the Cornell Guidelines. Oil can also be used at dormant stage. Plants appear to tolerate high levels of this scale.



Japanese maple scale on zelkova. Note size compared to lenticels © Dan Gilrein

Maskell Scale (*Lepidosaphes pallida*)

Hosts: Cryptomeria (most common host in NY). It can also be found on other conifers except pines including *Chamaecyparis*, *Cupressus*, *Juniperus*, *Picea*, *Sciadopitys*, *Sequoia*, *Taxodium*, *Taxus* and *Thuja*.

Description and Life Cycle: The scales are medium-brown and vaguely resemble photos of Glover scale on Plate 182 E and F in *Insects that Feed on Trees and Shrubs*. They are quite small ($1/16$ "), but easy to see with a hand lens. The crawlers are active in early to mid-June and may have at least a partial second generation in NY in late summer. Symptoms of infestation resemble winter damage, but on close inspection the scales are apparent. Heavy infestations can cause tree death.

Management: There seems to be very little information on the control of this pest. Cryptomeria have a reputation for sensitivity to horticultural oil sprays, although some applicators have used oil with no problem. Dr. Mike Raupp of the University of Maryland reported Cryptomeria on the UMD campus were treated for Maskell scale at crawler emergence, probably around early June, using 2% summer oil with good results (note that the Sunspray Ultra-Fine Oil label cautions to 'always use lower dosage or test spray oil-sensitive plants such as Cryptomeria'). Other labeled insecticides for crawlers are listed in the Cornell Guidelines. Watch for spruce spider mite damage, which from a distance may resemble Maskell scale injury.



Maskell scale on Cryptomeria © Dan Gilrein