CAPS Datasheets provide pest-specific information to support planning and completing early detection surveys.

Ceroplastes japonicus

Scientific Name

Ceroplastes japonicus Green, 1921

Synonym(s):

Ceroplastes floridensis japonicus Green, 1921
Ceroplastes floridensis var. japonicus Green

Common Name

Japanese wax scale
tortoise wax scale

Type of Pest

Scale insect

Taxonomic Position

Class: Insecta, **Order:** Hemiptera, **Family:** Coccidae

Figure 1. *Ceroplastes japonicus* adults (Source: Kenneth R. Law, USDA APHIS PPQ, Bugwood.org)

Notes on taxonomy and nomenclature:

Ceroplastes japonicus was previously misidentified as *C. floridensis*, but it is now recognized as a separate species (Longo, 1985).

Pest Recognition

This section describes characteristics of the organism and symptoms that will help surveyors recognize possible infestations/infections in the field, select survey sites, and collect symptomatic material. For morphological descriptions, see the Identification/Diagnostic resources on the AMPS pest page on the CAPS Resource and Collaboration website.

Pest Description

Identification of *C. japonicus* in the field is difficult. Precise identification requires preparation of slide-mounted adult females and examination by a trained taxonomist.

Adults: Only females are conspicuous and covered with thick wax. Young females are rectangular and almost flat, whereas mature females have a domed appearance, with a pinkish dorsal plate and 8 weakly defined lateral plates (Longo, 1985). The wax cover is

~1/8 in. long, ~1/8 in. wide and ~1/16 in. high (Longo, 1985). Color varies from grayish to pinkish white to pink (Figs. 1 and 2) (Longo, 1985; Miller et al., 2024). Adults are present on foliage along the vein, stems, and branches (Figs. 2 and 4A) (Cvetkovska-Gjorgievska et al., 2019).

Figure 2. *Ceroplastes japonicus* adult females: **(A)** with a pinkish hue, darker pink in younger nymphs, and whitish pink in adults, and **(B)** with a dark gray color. (Sources: (A) Kenneth R. Law, USDA APHIS PPQ, Bugwood.org; and (B) Giuseppina Pellizzari, Faculty of Agriculture, Dept. Entomology, Bugwood.org)

Nymphs: First and second instars are star-shaped (Xie and Xue, 2005). The wax continuously accumulates and changes their size and appearance as they grow (Fig. 3A and B) (Gill, 1988). Younger nymphs have a very thin glassy cover of wax on the back and white wax filaments, while older nymphs have thick wax developed around the filaments (Rosa et al., 2016).

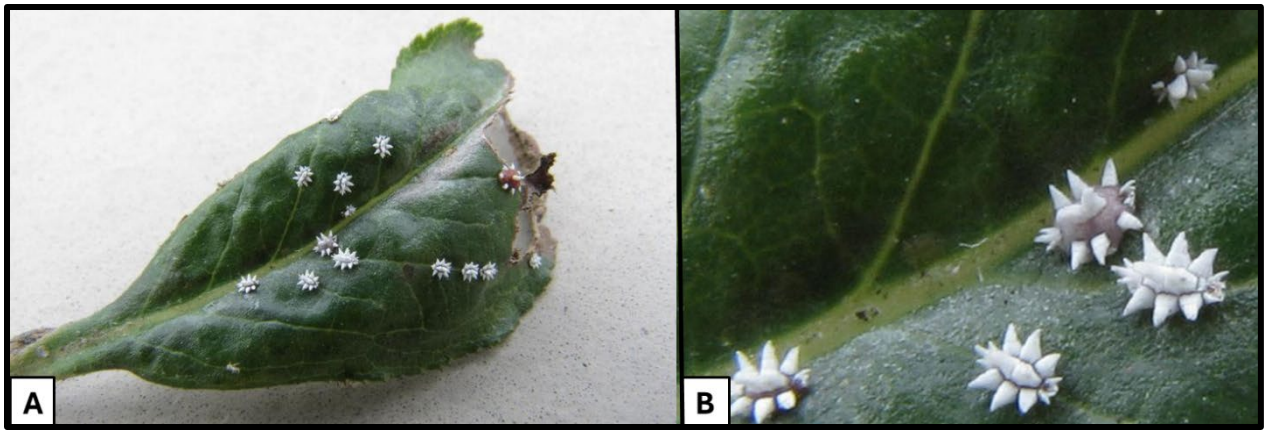

Figure 3. *Ceroplastes japonicus* nymphs: **(A)** on a leaf and **(B)** zoomed in (Source: Scott Yollis, Bugwood.org)

Figure 4. Signs and symptoms of wax scales: **(A)** *C. japonicus* adults and nymphs along the stems and the leaf veins, **(B)** honeydew and sooty mold covering *C. japonicus* scales and plant stems, and **(C)** sooty mold covering leaves and stems from *C. floridensis* infestation (Sources: (A) & (B) Giuseppina Pellizzari, Faculty of Agriculture, Dept. Entomology, Bugwood.org; (C) John Ruter, University of Georgia, Bugwood.org)

Signs and Symptoms

Signs are similar to those of other wax scales (Coccidae) and are the consequence of adult and nymphal feeding on the phloem (Camporese and Pellizzari, 1998). Signs and symptoms of infestation include:

- Reduced plant vigor, which in heavy infestations may result in chlorotic spotting, premature shedding of leaves, wilting, and stem dieback (Cvetkovska-Gjorgievska et al., 2019).
- Presence of honeydew, which may cause leaves and stems of the host to appear glossy or moist (Fig. 4B) (Gimpel et al., 1974; Kakoti et al., 2022).
- Black sooty mold growing on honeydew covered plant parts that looks like a dark crusty layer covering the affected area (Fig. 4C) (Mibey, 1997).
- The presence of foraging bees, wasps, hornets, and ants could indicate the presence of wax scales, as the honeydew attracts them (Joseph, 2024).

Easily Mistaken Species

Ceroplastes japonicus looks similar to other *Ceroplastes* species, as adult females all have a thick waxy covering that gives them a general dome appearance. Fourteen species of *Ceroplastes* are present in the United States, including several species that share hosts with *C. japonicus* (Table 1) (García Morales et al., 2016; Gimpel et al., 1974). These species cannot generally be differentiated by eye; slide-mount specimens and a microscope are needed for identification.

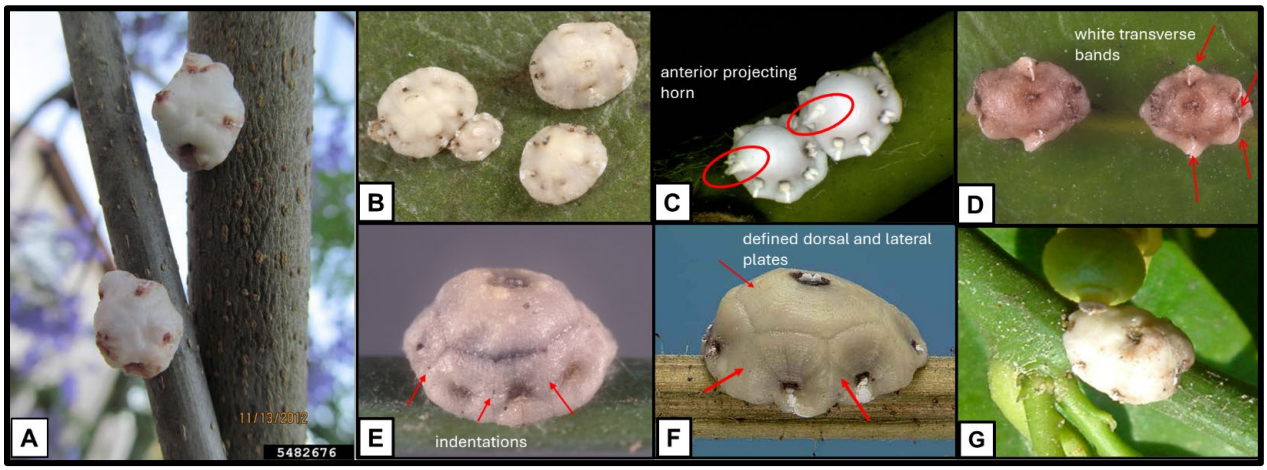

Figure 5. *Ceroplastes* spp. mistaken for *C. japonicus*: **(A)** *C. japonicus* **(B)** *C. floridensis*, **(C)** *C. ceriferus*, circles indicate the anteriorly projecting horn **(D)** *C. rubens*, arrows indicate the white transverse bands **(E)** *C. rusci,* arrows indicate the indentations in the lateral plates **(F)** *C. cirripediformis,* arrows indicate the defined dorsal and lateral plates, and **(G)** *C. sinensis* (Sources: (A) Kenneth R. Law, USDA APHIS PPQ, Bugwood.org; (B, D) Lyle Buss, University of Florida; (C) R.J Gill, USDA-ITP); (E & F) Lyle Buss, University of Florida; (G) María Teresa Martinez Ferrer and José Miguel Campos Rivela, CABI Compendium, doi:10.1079/cabicompendium.12353)

In addition to the species listed in Table 1, *Ceroplastes cistudiformis* and *C. irregularis* also occur in the United States but are generally not pests (Gill, 1988), and are unlikely to be encountered during visual surveys because *C. cistudiformis* only

shares *Citrus* as a common host with *C. japonicus* and *C. irregularis* does not share any of the preferred hosts with *C. japonicus* (Gill, 1988). Both species are present in California (García Morales et al., 2016).

Table 1. *Ceroplastes* spp. present in the United States that may be easily mistaken for *C. japonicus*

Mistaken species	Distribution in U.S.	Shared hosts with *C. japonicus*	Features to differentiate from *C. japonicus*
Ceroplastes floridensis (Fig. 5B)	Florida to New York and west to New Mexico (Hamon and Williams, 1984; Joseph and Hudson, 2023).	citrus, holly, and laurel (García Morales et al., 2016; Gimpel et al., 1974; Longo, 1985)	Requires slide-mount specimens to examine the arrangement and number of stigmatic setae (sensory structures that project from the body) (Miller et al., 2024)
Ceroplastes ceriferus (Fig. 5C)	widespread in the Southeast (Gimpel et al., 1974; Joseph and Hudson, 2023)	citrus, holly, and ivy (García Morales et al., 2016)	Has an anteriorly projecting horn in the wax cover (Lee et al., 2012) which is absent in *C. japonicus* (observed with aid of 20x hand lens).
Ceroplastes rubens (Fig. 5D)	South Florida (García Morales et al., 2016)	citrus, holly, ivy, and persimmon (Buss, 2024; García Morales et al., 2016; Gimpel et al., 1974).	The wax cover has a pink to reddish brown color vs. *C. japonicus* which is typically fair in color (grayish to pinkish white). Also has four white transverse bands of wax which are absent in *C. japonicus* (Choi et al., 2018; Green, 1909).
Ceroplastes rusci (Fig. 5E)	South Florida and California (Ellenrieder, 2025; García Morales et al., 2016; Gill, 1988).	citrus, holly, ivy, and persimmon (Buss, 2024; García Morales et al., 2016; Gimpel et al., 1974).	It has eight lateral plates, each with a depressed center separated from edges with indentations (Gimpel et al., 1974; Hodgson and Peronti, 2012) while *C. japonicus* has weakly defined lateral plates.
Ceroplastes cirripediformis (Fig. 5F)	California (García Morales et al., 2016)	citrus (García Morales et al., 2016)	The wax cover is reddish brown to brown with more defined dorsal and lateral plates (Gill, 1988) vs. *C. japonicus* which is typically fair in color (grayish to pinkish white) and with weakly defined lateral plates.

Mistaken species	Distribution in U.S.	Shared hosts with *C. japonicus*	Features to differentiate from *C. japonicus*
Ceroplastes sinensis (Fig. 5G)	California (García Morales et al., 2016)	citrus and holly (García Morales et al., 2016)	The wax cover has the anterior half white and the rest light brown to pinkish brown (Gill, 1988) vs. *C. japonicus* which is typically fair in color (grayish to pinkish white).

Commonly Encountered Non-targets

The approved survey method is visual inspection. Using this approved method to search for and collect *C. japonicus* on host plants, surveyors will encounter numerous non-target scale species, including the easily mistaken species mentioned in the previous section.

In addition to the easily mistaken species, there are many other scale insects on the most important hosts of *C. japonicus* (i.e., citrus, holly, ivy, and persimmon) that will be commonly encountered, visually distinct, and easy to avoid with careful inspection. The scales mentioned in the following paragraphs are either armored scales (Family Diaspididae), which have a round (e.g., *Aonidiella* spp.) or elongate (*Lepidosaphes* spp.) cover and are typically flat (Miller and Davidson, 2005), or soft scales (Family Coccidae), which are convex and have an "H" pattern formed by ridges (*Saissetia* spp.) or are ovoid, elongate, and flat (*Coccus* spp.) (Gill, 1988). Neither of those scale groups has the typical dome appearance with a thick wax cover present in *Ceroplastes* spp.

Commonly encountered scales in citrus include the following: *Aonidiella aurantii, A. citrina, Chrysomphalus aonidum, Coccus hesperidum, C. pseudomagnoliarum, Icerya purchasi, Lepidosaphes beckii, L. gloveri, Parlatoria pergandii, Pinnaspis aspidistrae, Saissetia neglecta*, and *S. oleae* (Futch et al., 2018; Grafton-Cardwell et al., 2024).

In persimmon, commonly encountered scales include *Hemiberlesia rapax, Pseudaulacaspis pentagona,* and *Parthenolecanium* spp. (Frank and Baker, 2019; Jordi, 2017; UC-IPM, 2017).

In holly, the common scales include *Coccus hesperidum, Parthenolecanium corni,* and *Pulvinaria floccifera,* whereas in ivy *Aspidotus nerii* and *C. hesperidum* are common (Bush and Collman, 2024; CAES, 2019).

Biology and Ecology

Ceroplastes japonicus has one generation per year (Longo, 1985; Pellizzari and Camporese, 1994). Eggs are laid in groups under the female body on twigs and leaves (Longo, 1985). In Bulgaria, Italy, and Japan, eggs are laid towards the end of spring and hatch in the summer (Longo, 1985; Pencheva, 2009; Tamura, 1971). Because the life cycle is highly dependent on temperature (Camacho and Chong, 2015; Frank, 2020),

this timing may shift earlier in the season in warmer areas. Egg development takes 10–30 days (Camporese and Pellizzari, 1998; Tamura, 1971). After hatching, the mobile first instar nymphs (commonly known as ‘crawlers’) move around the host plant for approximately 30 minutes or less until they find a suitable area to settle, which occurs by inserting the piercing mouthparts and staying fixed to typically feed indefinitely (Marotta, 1997; Tamura, 1971). They prefer the upper side of the leaves along the main veins rather than the stems or twigs (Camporese and Pellizzari, 1998; Tamura, 1971).

Once settled, nymphs feed on their hosts and begin producing a wax cover that continues to grow and change in color and shape as they reach maturity (Fig. 2A) (Marotta, 1997; Rosa et al., 2016). The thick wax cover protects the scale from natural enemies and insecticides (Gullan and Kosztarab, 1997). The nymphal stage lasts an average of 117 days (Camporese and Pellizzari, 1998).

Ceroplastes japonicus nymphs molt into adult females in mid-fall and are present through the summer of the next year (Camporese and Pellizzari, 1998; Yasnosh and Japoshvili, 1998). Once mature, females reproduce mainly by sexual reproduction, although asexual reproduction (parthenogenesis) also occurs (Camporese and Pellizzari, 1998; Gimpel et al., 1974). Sexual reproduction has been observed in its native range (East Asia) and in Georgia and Italy (Camporese and Pellizzari, 1998; Rainato and Pellizzari, 2008; Tamura, 1971; Yasnosh and Japoshvili, 1998). Gravid females overwinter in the branches or on the leaves of their host plants (Jančar et al., 1999). They lay eggs in the spring (Longo, 1985) and can lay up to 2,500 eggs in their lifetime, though this varies by host (Tamura, 1971; Yasnosh and Japoshvili, 1998). Adult females can live for up to seven months (Camporese and Pellizzari, 1998); the longevity of males is unknown.

In Italy, *C. japonicus* can withstand temperatures below 32°F, unlike other *Ceroplastes* (*C*. *rusci* and *C*. *sinensis*) that cannot survive cold winters (Pellizzari and Camporese, 1994). In laboratory experiments, Liu et al. (2017) determined that the lowest temperature *C. japonicus* can survive is 7 °F, while Khokhlov et al. (2017), citing Yasnosh (1952), state that the minimum temperature the scales can survive is -11°F.

Known Hosts

Ceroplastes japonicus is a polyphagous pest of deciduous and evergreen fruit trees and ornamental plants, both outdoors and indoors (Ben-Dov, 1993; Pellizzari and Germain, 2010; Tamura, 1971). Reported hosts belong to 37 families and 55 genera (García Morales et al., 2016).

The host list below includes cultivated and wild plants that 1) are infected or infested by the pest under natural conditions, 2) are frequently described as major, primary, or preferred hosts, and 3) have primary evidence for feeding and damage documented in the literature. Plants are highlighted in bold if they are commercially produced and the pest causes economically significant damage.

Table 2. Preferred hosts of *Ceroplastes japonicus*

Scientific Name	Common Name	Presence in the US*	Type/Use	Reference
Citrus ×limon	lemon	Present	Cultivated	Jančar et al., 1999
Citrus reticulata	tangerine	Present	Cultivated	Jančar et al., 1999
Diospyros kaki	Japanese persimmon	Present	Cultivated	Papadopoulou et al., 2020
Hedera helix	ivy	Present	Ornamental	Camporese and Pellizzari, 1998
Ilex aquifolium	English holly	Present	Ornamental	Klupacs and Volent, 2012
Laurus nobilis	bay laurel	Present	Ornamental/ Cultivated	Yasnosh and Japoshvili, 1998

Table 3. Other hosts of *Ceroplastes japonicus*

Scientific Name	Common Name	Presence in the US*	Type/Use	Reference
Acer palmatum	Japanese maple	Present	Ornamental	Suh, 2020
Camellia sinensis	tea	Present	Cultivated	Kakoti et al., 2022
Citrus trifoliata	hardy orange	Present	Ornamental	Pellizzari and Camporese, 1994
Euonymus japonicus	Japanese spindletree	Present	Ornamental	Tamura, 1971
Fatsia japonica	paperplant	Absent	Ornamental	Camporese and Pellizzari, 1998
Ilex sp.	holly	Present	Ornamental	Pellizzari and Camporese, 1994
Morus alba	white mulberry	Present	Wild/ornamental	Ülgentürk and Mohammed, 2016
Nageia nagi (= Podocarpus nagi)	Asian bayberry	Absent	Wild	Sakurai et al., 2020
Prunus laurocerasus (=Laurocerasus officinalis)	cherry laurel	Present	Ornamental	Japoshvili et al., 2008
Prunus mongolica	n/a	Absent	n/a	Tamura, 1971
Platanus orientalis	Oriental planetree	Absent	Ornamental	Stryukova and Stryukov, 2022

*Presence in the U.S. confirmed by USDA-NRCS, 2024 and AgMRC, 2024

Suh (2020) citing Paik (1978) mentions additional hosts in Korea including *Buxus koreana, Camellia japonica, Chaenomeles sinensis, Citrus junos, Elaeagnus umbellata, Eriobotrya japonica, Euonymus japonicus, Eurya japonica, Forsythia koreana, Gardenia jasminoides, Ginkgo biloba, Ilex cornuta, I. integra, Magnolia kobus, Malus asiática, Pittosporum tobira, Prunus armeniaca, P. serrulata, P. verecunda, Punica granatum, Pyrus pyrifolia, Quercus acutissima, Rhaphiolepis indica, Viburnum odoratissimum* and *Yucca gloriosa*, but we could not locate direct evidence to support these.

Pest Importance

Several *Ceroplastes* spp. are important pests of citrus and ornamentals worldwide (Gill and Kosztarab, 1997). *Ceroplastes japonicus* is considered to be a serious pest in citrus, persimmon, date-plum, mulberry, and ornamentals such as holly and ivy (Pellizzari and Camporese, 1994; Yasnosh and Japoshvili, 1998). The feeding of this scale eventually weakens fruit trees and leads to a decrease in yield (Camporese and Pellizzari, 1998; Longo, 1985; Yasnosh and Japoshvili, 1998). In ornamentals, the feeding damage and secondary sooty mold growth is unsightly and reduces the market value of infested plants (Camporese and Pellizzari, 1998; Pencheva, 2009). In China, fruit losses of up to 70% due to this scale have been reported in persimmon and jujube (Cvetkovska-Gjorgievska et al., 2019). In North Macedonia, it is considered a serious threat to fruit production as heavily infested persimmon trees have shown defoliation and cosmetic damage to fruit (Lazarevska et al., 2017). In Italy, this insect is considered a serious phytosanitary threat to laurel, English holly, and ivy (Mazzeo et al., 2014).

In citriculture areas in the Mediterranean region, where other scales (including several species of *Ceroplastes*) are present and considered of economic importance, *C. japonicus* has always been below economic injury level (Jacas et al., 2010). Given the similarity in climate and the assemblage of scales present in U.S. citriculture areas with those in the Mediterranean region, the impacts of *C. japonicus* may also be below economic injury level.

Ceroplastes japonicus is listed as a harmful organism in Brazil, Chile, Costa Rica, Ecuador, Eurasian Customs Union [Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia], Georgia, Guatemala, Morocco, Peru, Uruguay, and Uzbekistan. There may be trade implications with these countries if this pest becomes established in the United States (USDA-PCIT, 2024).

Pathogens or Associated Organisms Vectored

There is no evidence that *C. japonicus* directly vectors any plant pathogen. However, the scale's honeydew excretions facilitate the growth of secondary fungi known as sooty mold (Yasnosh and Japoshvili, 1998).

Known Distribution

Ceroplastes japonicus is native to Asia and was introduced into the northern Mediterranean basin (Italy), from which it spread to other European countries (Ben-Dov, 1993; Kozar et al., 1984; Pellizzari and Germain, 2010).

Table 4. Countries where *Ceroplastes japonicus* is known to occur.

Region/Continent	Country	Reference
Asia	Azerbaijan	Japoshvili and Karaca, 2007
Asia	China	Liu et al., 2009
Asia	Japan	Tamura, 1971
Asia	South Korea	Suh, 2019
Europe	Armenia	Beglaryan, 2003

Region/Continent	Country	Reference
Europe	Bulgaria	Pencheva and Yovkova, 2016
Europe	Croatia	Masten-Milek et al., 2007
Europe	France	Kreiter et al., 2022
Europe	Georgia	Yasnosh and Japoshvili, 1998
Europe	Germany	Schönfeld, 2015
Europe	Greece	Papadopoulou et al., 2020
Europe	Hungary	Klupacs and Volent, 2012
Europe	Italy	Pellizzari and Camporese, 1994
Europe	North Macedonia	Cvetkovska-Gjorgievska et al., 2019
Europe	Russia (Sochi region)	Gavrilov and Kuznetsova, 2004
Europe	Slovenia	Seljak, 2010
Europe	Switzerland	Sutter et al., 2021
Europe	Turkey	Ülgentürk et al., 2022
Europe	Ukraine	Stryukova and Stryukov, 2022

Ceroplastes japonicus is reported as being present in Nepal (EPPO, 2024), but we found no direct evidence that it is present there.

Pathway

Trade and movement of fruit trees and ornamental plants for commercial and hobby purposes appears to be the main pathway of introduction (Cvetkovska-Gjorgievska et al., 2019; Mazzeo et al., 2014; Pellizzari and Germain, 2010). Wax scales are small insects that are usually concealed on host plants; therefore, they are frequently accidentally introduced to new areas (Malumphy, 2010; Miller et al., 2005).

Natural spread is only possible by the movement of first instar nymphs before they settle permanently on the host. Most nymphs only move up to 1.6 ft. and typically remain on the plant where they hatched. However, they may disperse further when aided by the wind or moved on agricultural tools (Tamura, 1971;Yasnosh and Japoshvili, 1998). The related species *C. floridensis* has been captured in traps up to 820 ft. downwind from infested trees (Yardeni, 1987), while *Coccus hesperidum* was collected in traps 15 ft. in the air (Reed et al., 1970), suggesting that wind may aid the natural dispersal of scales.

Use the PPQ Commodity Import and Export manuals listed below to determine 1) if host plants or material are allowed to enter the United States from countries where the organism is present and 2) what phytosanitary measures (e.g., inspections, phytosanitary certificates, post entry quarantines, mandatory treatments) are in use. These manuals are updated regularly.

Agricultural Commodity Import Requirements(ACIR) manual: ACIR provides a single source to search for and retrieve entry requirements for imported commodities.

Potential Distribution within the United States

Based on the known distribution of *C. japonicus* and comparing those climates to Global Plant Hardiness Zones (Takeuchi et al., 2018), we expect that *C. japonicus* could establish in plant hardiness zones 7-10. The Southeast, southern Midwest, Southwest, coastal portions of the Mid-Atlantic, California, Hawaii, Puerto Rico and portions of Nevada, Colorado, Idaho, Utah, and Washington have suitable conditions for the establishment of *C. japonicus* (SAFARIS, 2024). *Ceroplastes japonicus* has been reported as a greenhouse and indoor pest, so it could potentially establish in unsuitable areas in protected environments.

Ceroplastes japonicus is a pest of fruit trees and ornamental plants that are distributed in fruit orchards, urban parks, gardens, nurseries, and greenhouses (Lazarevska et al., 2017; Papadopoulou et al., 2020; Pellizzari and Germain, 2010).

Preferred hosts include species of *Citrus*, *Diospyros*, *Ilex*, and *Hedera* (Pellizzari and Camporese, 1994). The top producing states for citrus fruit are California, Florida, and Texas (NASS, 2024). Persimmons are grown in California, Florida, and Texas, with a value of over $20 million (AgMRC, 2024; UC-Davis, 2024). *Ilex aquifolium* is grown as an ornamental in Oregon and Washington (NWHGA, 2012), and *Ilex* spp. and *Hedera helix* are common throughout most of the United States (USDA-NRCS, 2024).

Based on climate suitability and the production of commercial hosts, California, Florida, Texas, Oregon, Washington, and the Southeast are at risk for impacts by this pest should it establish.

Survey and Key Diagnostics

Approved Methods for Pest Surveillance*:

For the current approved methods and guidance for survey and identification, see Approved Methods for Pest Surveillance (AMPS) pest page on the CAPS Resource and Collaboration website, at https://approvedmethods.ceris.purdue.edu/.

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Versions

December 2011: Datasheet completed (Version 1)

September 2025 (Version 2)

- Created new **Pest Recognition** section by combining Pest Description and Damage/Signs and Symptoms
- Added **Easily Mistaken Species** section
- Added **Commonly Encountered Non-targets** section
- Updated **Biology & Ecology** section
- Updated **Known hosts** section
- Updated **Pest Importance** section with economic losses in various countries.
- Updated **Pathogens or Associated Organisms Vectored** section
- Updated **Known Distribution** section
- Updated **Pathway** section
- Updated **Potential Distribution within the United States** section
- Updated guidance for **Approved Methods** section.

Reviewer(s)

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