EPPO Datasheet: *Xanthomonas arboricola pv. pruni*

Last updated: 2023-07-13

IDENTITY

Preferred name: *Xanthomonas arboricola pv. pruni*
Authority: (Smith) Vauterin, Hoste, Kersters & Swings
Taxonomic position: Bacteria: Proteobacteria: Gammaproteobacteria: Lysobacterales: Lysobacteraceae
Other scientific names: *Pseudomonas pruni* Smith, *Xanthomonas campestris pv. pruni* (Smith) Dye, *Xanthomonas pruni* (Smith) Dowson
Common names: bacterial canker of stone fruits, bacterial leaf spot of stone fruits, bacterial shot-hole of stone fruits, black spot of plum
view more common names online...
EPPO Categorization: A2 list
view more categorizations online...
EU Categorization: PZ Quarantine pest ((EU) 2019/2072 Annex III), RNQP ((EU) 2019/2072 Annex IV)
EPPO Code: XANTPR



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Notes on taxonomy and nomenclature

Xanthomonas arboricola pv. *pruni* forms a monophyletic group with only limited genetic variation within *X. arboricola*. Some *X. arboricola* isolates that do not belong to this group have also been isolated from *Prunus* spp. (Bergsma-Vlami *et al.*, 2012; Garita-Cambronero *et al.*, 2017; Kawaguchi, 2014; Lopez-Soriano *et al.*, 2016; Zarei *et al.*, 2022).

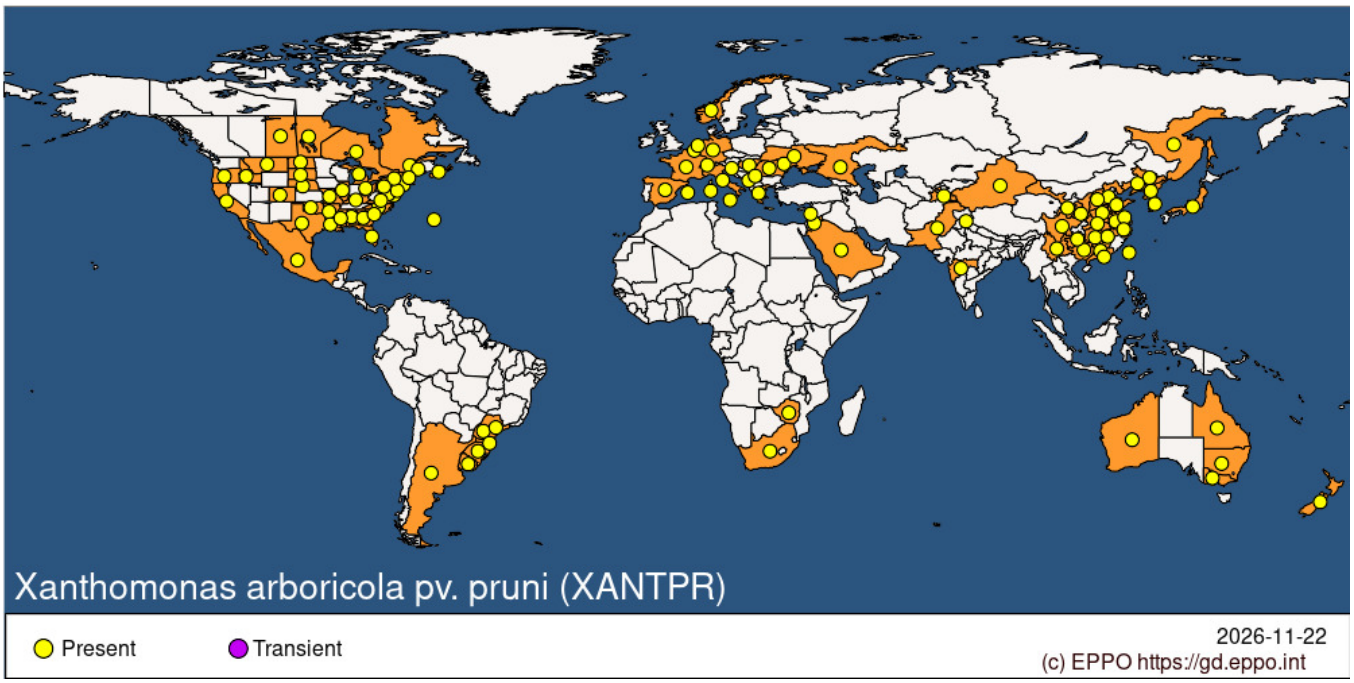
HOSTS

X. arboricola pv. *pruni* is found exclusively on *Prunus* spp. and thus only infects this genus of hosts. The following crops are particularly affected: almond (*P. dulcis*), peach (*P. persica*) including nectarine (*P. persica* var. *nucipersica*), sour cherry (*P. cerasus*), sweet cherry (*P. avium*), European plum (*P. domestica*), apricot (*P. armeniaca*) and Japanese plum (*P. salicina*). Other exotic or ornamental species of *Prunus* attacked include *P. davidiana* and cherry laurel (*P. laurocerasus*). Cultivars of the Sino-Japanese group (*P. japonica* and *P. salicina*) are generally more susceptible than European plums (Bazzi & Mazzucchi, 1984; Topp *et al.*, 1989; Garita-Cambronero *et al.*, 2018).

Host list: *Prunus apetala*, *Prunus armeniaca*, *Prunus avium*, *Prunus buergeriana*, *Prunus cerasus*, *Prunus davidiana*, *Prunus domestica*, *Prunus dulcis*, *Prunus japonica*, *Prunus laurocerasus*, *Prunus mume*, *Prunus persica var. nucipersica*, *Prunus persica*, *Prunus salicina*, *Prunus x lannesiana*

GEOGRAPHICAL DISTRIBUTION

X. arboricola pv. *pruni* has a worldwide distribution and is present in most areas where *Prunus* spp. are being cultivated although it is not always widespread within these regions. It has been present in the EPPO region (e.g. in Italy) for decades but it was first described in North America (EFSA, 2014). However, it is not clear (from the literature) whether it has initially spread only from North America.



EPPO Region: Belgium, France (mainland), Germany, Greece (mainland), Hungary, Italy (mainland, Sardegna, Sicilia), Jordan, Moldova, Republic of, Montenegro, Netherlands, Norway, Romania, Russian Federation (Far East, Southern Russia), Serbia, Slovenia, Spain (mainland, Islas Baleares), Switzerland, Ukraine
Africa: South Africa, Zimbabwe
Asia: China (Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xianggang (Hong Kong), Xinjiang, Yunnan, Zhejiang), India (Himachal Pradesh, Maharashtra), Japan (Honshu), Jordan, Korea, Democratic People's Republic of, Korea, Republic of, Lebanon, Pakistan, Saudi Arabia, Taiwan, Tajikistan
North America: Canada (Manitoba, Nova Scotia, Ontario, Québec, Saskatchewan), Mexico, United States of America (Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Kentucky, Louisiana, Maine, Maryland, Michigan, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Virginia)
Central America and Caribbean: Bermuda
South America: Argentina, Brazil (Parana, Rio Grande do Sul, Santa Catarina, Sao Paulo), Uruguay
Oceania: Australia (New South Wales, Queensland, Victoria, Western Australia), New Zealand

BIOLOGY

X. arboricola pv. *pruni* overwinters in infected parts of the plant such as dormant buds, leaf scars and cankers. On plum and apricot, summer cankers formed in the previous season continue developing the following spring, so providing a source of inoculum at this time. Mummified almond fruit and fallen leaves have also been reported as overwintering sites (Haack *et al.*, 2020; Zaccardelli *et al.*, 1998).

In the spring, before host division starts, the bacteria in the intercellular spaces multiply and cause the epidermis to rupture, so initiating a visible lesion referred to as a spring canker. Inoculum from these cankers is disseminated in rain and wind. The bacteria initially multiply epiphytically but can later switch to a parasitic lifestyle and infect new leaf growth via stomata or wounds. Especially during the epiphytic phase biofilm formation is thought to play a crucial role. *X. arboricola* pv. *pruni* can also survive and proliferate as an epiphyte on several non-host plants that can occur as weeds or cultivated plants on or near plantations with *Prunus* species. However, the role of these epiphytic populations in disease outbreaks is unclear. Lesions developing on the leaf exude bacteria which cause secondary infections on fruits, twigs and trunks (Garita-Cambronero *et al.*, 2019; Lamichhane, 2014; Sabuquillo & Cubero, 2021; Zarei *et al.*, 2018). Pruning operations may also transmit the disease (Goodman & Hattingh, 1988). Insects which damage plum bark, such as *Cicada* spp. in New Zealand, can provide points for entry.

Following foliage infection, summer cankers develop in the green tissue of the shoot, but usually become sealed off by a periderm layer and, as cankers tend to dry out during the course of summer, the viability of bacteria therein is largely reduced; thus, except in certain localities, summer cankers in plum and peach are of no importance as overwintering sites for the bacterium, or in initiating infections the following spring. In general, it is the late infections of shoots, occurring during rains just before and during leaf fall in the autumn, when the host resistance mechanism of producing a periderm barrier is reduced, which constitute the primary inoculum source for the following spring (Lamichhane, 2014; Scortichini, 2010).

A warm season with maximum temperatures of 25-33°C and with light, frequent rains accompanied by fairly heavy winds and heavy dews is most favorable for severe infection. The disease tends to appear and spread in the spring, then makes little progress through the summer, but late infections occur in the autumn. The disease is not usually found in arid regions (Anderson, 1956; Hayward & Waterston, 1965; Morales *et al.*, 2017; Scortichini, 2010).

DETECTION AND IDENTIFICATION

Symptoms

Symptoms can be observed on all above ground parts of the plant except for the flowers. For each host different typical symptoms can be formed but some general characteristics also exist (EPPO, 2021a&b).

Usually the first symptoms are observed on the leaves where small angular spots are formed. These spots are initially translucent or pale green but later turn dark purple, brown, or black. These spots can grow over time and are mostly formed close to main veins or the apical edge of the leaf. On peach and nectarine, the area immediately surrounding the spots may become yellow and eventually leaves may drop. The necrotic spot might drop out, giving a shot-hole appearance to the leaf. Often, a dark ring of diseased tissue is left with the formation of the holes and this shot-hole effect is usually more pronounced on plum, cherry and cherry laurel. On leaves of almond trees the lesions are surrounded by chlorotic tissue, but this chlorosis is limited to only a few millimeters. Defoliation of almond as a result of a *X. arboricola* pv. *pruni* infection is rare and only occurs if trees are severely infected (Garita-Cambronero *et al.*, 2018; Palacio-Bielsa *et al.*, 2010).

On fruits small circular brown spots appear on the surface. They become sunken, the margins are frequently water-soaked, and there are often light-green halos which impart a mottled appearance to the fruit. As a result of natural enlargement of the fruit, pitting and cracking occur in the vicinity of the spots. These cracks are often very small and difficult to see, but where heavy infection has occurred on young fruit they can be extensive, severely damaging the fruit surface. Gum flow, particularly after rain, may occur from bacterial wounds, this may easily be confused with insect damage. For almond, symptoms on the fruit are very characteristic. In spring sunken, corky lesions with oozing gum are formed. These lesions become raised in summer when the mesocarp is dehydrated. In cherry, early fruit infection results in distorted fruits, and bacteria may be found from the epidermis to the stone (Garita-Cambronero *et al.*, 2018; Palacio-Bielsa *et al.*, 2010).

The formation of symptoms on stem and branches of *Prunus* spp. is less common but this does occur. Spring cankers appear on the top portion of overwintering twigs and on water sprouts before green shoots are produced. Water-soaked, slightly darkened, superficial blisters occur extending 1-10 cm parallel to the long axis of the twig. Severe infections may cause the tip of a twig to die, while the tissue immediately below the dead area, in which the bacteria are present, is characteristically dark; this is the so-called “black tip” injury. Twig infections later in the season result in summer cankers, which appear as water-soaked, dark-purplish spots surrounding lenticels. These later dry out and become limited, dark, sunken, circular to elliptical lesions with a water-soaked margin. Cankers are more common on plum and are perennial on plum and apricot, where they continue developing in twigs of 2 and 3 years old.

Other bacterial pathogens can cause symptoms on *Prunus* spp. that can be hard to distinguish from symptoms caused by *X. arboricola* pv. *pruni*. *Xanthomonas prunicola* has been isolated from cankers on nectarine trees and has been shown to be able to cause necrotic lesions on leaves identical to those caused by *X. arboricola* pv. *pruni* (Lopez *et al.* , 2018). During a survey in Iran on stone fruit multiple *Pantoea* species were detected from different *Prunus* plants that showed *X. arboricola* pv. *pruni* like symptoms but *X. arboricola* pv. *pruni* was not found (Zarei *et al.*, 2019). Other sources of possible confusion are mentioned in Standard PM 7/64 (EPPO, 2021a).

Morphology

X. arboricola pv. *pruni* is an aerobic, motile, non-sporulating, Gram-negative rod, 0.2-0.8 x 0.8-1.7 µm, with a single polar flagellum. Colonies are wet shining, convex, of a slimy mucoid consistency, and produce a yellow water-insoluble pigment (Hayward & Waterston, 1965).

Detection and inspection methods

A procedure for inspection of places of production of *Prunus* spp. trees is provided in Standard PM 3/76 (EPPO, 2021b), including guidance for the testing of symptomless mother trees, when necessary. Inspections should be performed during the growing season and samples for diagnostic analysis can be taken from both symptomatic as well as asymptomatic material.

Symptoms of *X. arboricola* pv. *pruni* can be confused with that caused by other biotic and abiotic factors, e.g. symptoms of *X. prunicola*. Therefore, when the presence of *X. arboricola* pv. *pruni* is suspected this needs to be confirmed by a diagnostic analysis.

Two LAMP tests (Bühlmann *et al.*, 2013; Li *et al.*, 2019), several PCR tests (Pagani, 2004; Park *et al.*, 2010; Pothier *et al.*, 2011) and two real-time PCR tests (Garita-Cambronero *et al.*, 2017; Palacio-Bielsa *et al.*, 2011) have been developed. In most cases these tests can specifically detect and identify *X. arboricola* pv. *pruni*. Additionally, the tests of Palacio-Bielsa *et al.* (2011) and Bühlmann *et al.* (2013) have been evaluated in a test performance study (Palacio-Bielsa *et al.*, 2015). The EPPO diagnostic protocol PM 7/64 provides extensive guidelines on the isolation and molecular detection and identification of *X. arboricola* pv. *pruni* using several of the above-mentioned protocols (EPPO, 2021a).

PATHWAYS FOR MOVEMENT

X. arboricola pv. *pruni* disperses locally by rain splash, wind and via the use of contaminated tools in orchards. In international trade, it is likely to be carried on latently infected plants for planting (except seeds) of host species, including budwood (Garita-Cambronero *et al.*, 2018). The bacterium may also travel long distances on infected fruits, but this does not appear to contribute to new outbreaks.

PEST SIGNIFICANCE

Economic impact

The greatest damage arises from severe defoliation resulting in weakened trees. Heavily infected trees gradually became uneconomic as leaders die, following invasion by *X. arboricola* pv. *pruni*. In addition, fruits of infected plants are small and lower quality often making them unmarketable. In neglected peach orchards, 25-75% of fruits may be attacked. Control measures during epidemic years, mainly consisting of copper treatments, cause higher productions costs and may have deleterious effects on the environment (Dunegan, 1932; EFSA, 2014). Within the EU recurrent epidemics have caused damage on plum in Italy, on peach in France and on peach and almond in Spain. The production losses caused by *X. arboricola* pv. *pruni* on almond in Spain have been estimated between 23% and 46% (EFSA, 2014; Palacio-Bielsa *et al*., 2014).

Control

The control of *X. arboricola* pv. *pruni* can be very difficult when climatic conditions are optimal for the pathogen. Tolerant and resistant cultivars are available for growers. However the choice is limited, and most peach, apricot and Japanese plum varieties are susceptible to *X. arboricola* pv. *pruni*. Therefore, the use of certified plant material is important to avoid introduction of the pathogen (EPPO, 2001a&b). Copper sprays can be used to reduce the disease load in orchards, but some *Prunus* spp. are highly susceptible to phytotoxicity and copper treatments may therefore

damage the plants. In addition, general concerns regarding the use of copper in agriculture, such as the occurrence of copper-resistant strains and soil accumulation, limit the use of this product (EFSA, 2014; Lamichhane *et al.*, 2018). Alternative approaches to prevent or limit *X. arboricola* pv. *pruni* outbreaks, such as the use of plant elicitor peptides or antimicrobial compounds produced by *Pseudomonas aeruginosa*, are being investigated but are not yet available for the use in a commercial setting (Ruiz *et al.*, 2018; Silva Vasconcellos *et al.*, 2014).

Phytosanitary risk

For cherry and European plum only minimal effects on yield are observed. For peach, nectarine, almond and Japanese plum damage to fruits often does not result in reduced yields but makes the affected fruits unmarketable. When conditions are favorable for the pathogen, *X. arboricola* pv. *pruni* is able to cause severe damage mainly to susceptible peach and plum varieties leading to strong yield reduction and even plant death (EFSA, 2014).

PHYTOSANITARY MEASURES

To prevent the introduction and spread of *X. arboricola* pv. *pruni*, import requirements for *Prunus* plants for planting (other than seeds) apply worldwide. These requirements can vary with regards to prevalence in the country of origin, and include production in a pest-free area or a pest-free place/site of production.

As well as preventing introduction, it is essential to start cultivation with non-infected plants for planting. Therefore, absence in mother plants and nuclear stock should be assured before the start of breeding, propagation and/or production of plants for planting (EPPO, 2001a&b). When it was deregulated as a quarantine pest, *X. arboricola* pv. *pruni* was recommended for regulation as a regulated non-quarantine pest (RNQP) for *Prunus* propagation material (other than seeds; either to be used for fruit production or as ornamental) during the EU Quality pest project (Picard *et al*., 2018). As such *Prunus* spp. material intended for planting should come from areas that are known to be free from *X. arboricola* pv. *pruni*, from pest-free production sites, to have been tested, or inspected for evergreen species before dispatch (See more detailed phytosanitary measures recommended at https://rnqp.eppo.int/recommendations).

REFERENCES

Anderson HW (1956) *Diseases of fruit crops*, pp. 206-215. McGraw-Hill Book Co. Inc., New York (US).

Bazzi C & Mazzucchi U (1984) [Update on the most important bacterial diseases of fruit crops in the nursery]. *Informatore Agrario* **34**, 51-62.

Bergsma-Vlami M, Martin W, Koenraadt H, Teunissen H, Pothier JF, Duffy B & Van Doorn J (2012) Molecular typing of Dutch isolates of *Xanthomonas arboricola pathovar pruni* isolated from ornamental cherry laurel. *Journal of Plant Pathology* **94**, S29-S35.

Bühlmann A, Pothier JF, Tomlinson JA, Frey JE, Boonham N, Smits THM & Duffy B (2013) Genomics-informed design of loop-mediated isothermal amplification for detection of phytopathogenic *Xanthomonas arboricola* pv. *pruni* at the intraspecific level. *Plant Pathology* **62**, 475-484.

Dunegan JC (1932) The bacterial spot disease of the peach and other stone fruits. *Technical Bulletin US Department of Agriculture* No. **273**, 53 pp.

EFSA PLH Panel (EFSA Panel on Plant Health) (2014) Scientific opinion on pest categorisation of *Xanthomonas arboricola* pv. *pruni* (Smith) Dye. *EFSA Journal* **12**, 3857, 25 pp.

EPPO (2001a) Schemes for the production of healthy plants for planting. EPPO Standard PM 4/29(1). Certification scheme for cherry. *EPPO Bulletin* **31**, 447-461.

EPPO (2001b) Schemes for the production of healthy plants for planting. EPPO Standard PM 4/30(1). Certification scheme for almond, apricot, peach and plum. *EPPO Bulletin* **31**, 463-478.

EPPO (2021a) Diagnostics. EPPO Standards PM 7/64 (2) *Xanthomonas arboricola* pv. *pruni*. *EPPO Bulletin* **51**,

240-266.

EPPO (2021b) Phytosanitary procedures. EPPO Standards PM 3/76 (2) Trees of *Malus, Pyrus, Cydonia* and *Prunus* spp.*:* Inspection of places of production. *EPPO Bulletin* **51**, 354-386.

Garita-Cambronero J, Palacio-Bielsa A & Cubero J (2018) *Xanthomonas arboricola* pv. *pruni*, causal agent of bacterial spot of stone fruits and almond: its genomic and phenotypic characteristics in the X. arboricola species context. *Molecular Plant Pathology* **19**, 2053-2065.

Garita-Cambronero J, Palacio-Bielsa A, Lopez MM & Cubero J (2017) Pan-genomic analysis permits differentiation of virulent and non-virulent strains of *Xanthomonas arboricola* that cohabit *Prunus* spp. and elucidate bacterial virulence factors. *Frontiers in Microbiology* **8**, 573.

Garita-Cambronero J, Sena-Vélez M, Ferragud E, Sabuquillo P, Redondo C & Cubero J (2019) *Xanthomonas citri* subsp. *citri* and *Xanthomonas arboricola* pv. *pruni*: comparative analysis of two pathogens producing similar symptoms in different host plants. *Plos One* **14**, e0219797.

Goodman CA & Hattingh MJ (1988) Mechanical transmission of *Xanthomonas campestris* pv. *pruni* in plum nursery trees. *Plant Disease* **72**, 643.

Haack SE, Wade L, Forster H & Adaskaveg JE (2020) Epidemiology and management of bacterial spot of almond caused by *Xanthomonas arboricola* pv. *pruni*, a new disease in California. *Plant Disease* **104**, 1685-1693.

Hayward AC & Waterston JM (1965) *Xanthomonas pruni*. *CMI Descriptions of Pathogenic Fungi and Bacteria* No. **50**. CABI , Wallingford (GB)

Kawaguchi A (2014) Genetic diversity of *Xanthomonas arboricola* pv. *pruni* strains in Japan revealed by DNA fingerprinting. *Journal of General Plant Pathology* **80**, 366-369.

Lamichhane JR (2014) *Xanthomonas arboricola* diseases of stone fruit, almond, and walnut trees: progress toward understanding and management. *Plant Disease* **98**, 1600-1610.

Lamichhane JR, Osdaghi E, Behlau F, Köhl J, Jones JB & Aubertot J-N (2018) Thirteen decades of antimicrobial copper compounds applied in agriculture. A review. *Agronomy for Sustainable Development* **38**, 28

Li W, Lee SY, Back CG, Ten LN & Jung HY (2019) Loop-mediated isothermal amplification for the detection of *Xanthomonas arboricola* pv. *pruni* in peaches. *The Plant Pathology Journal* **35**, 635-643.

Lopez-Soriano P, Boyer K, Cesbron S, Morente MC, Penalver J, Palacio-Bielsa A, Verniere C, Lopez MM & Pruvost O (2016) Multilocus variable number of tandem repeat analysis reveals multiple introductions in Spain of *Xanthomonas arboricola* pv. *pruni*, the causal agent of bacterial spot disease of stone fruits and almond. *Plos One* **11**, e0163729.

Lopez MM, Lopez-Soriano P, Garita-Cambronero J, Beltran C, Taghouti G, Portier P, Cubero J, Fischer-Le Saux M & Marco-Noales E (2018) *Xanthomonas prunicola* sp. *nov.*, a novel pathogen that affects nectarine (*Prunus persica var. nectarina*) trees. *International Journal of Systematic and Evolutionary Microbiology* **68**, 1857-1866.

Morales G, Llorente I, Montesinos E & Moragrega C (2017) A model for predicting *Xanthomonas arboricola* pv. *pruni* growth as a function of temperature. *Plos One* **12**, e0177583.

Pagani MC (2004) *An ABC transporter protein and molecular diagnoses of Xanthomonas arboricola pv. pruni causing bacterial spot of stone fruits. Dissertation in partial fulfillment of the requirements for the Degree of Doctor of Philosophy*. North Carolina State University, Raleigh (US).

Palacio-Bielsa A, Rosello M, Cambra MA & Lopez MM (2010) First report on almond in Europe of bacterial spot disease of stone fruits caused by *Xanthomonas arboricola* pv. *pruni*. *Plant Disease* **94**, 786.

Palacio-Bielsa A, Cubero J, Cambra MA, Collados R, Berruete IM & Lopez MM (2011) Development of an efficient

real-time quantitative PCR protocol for detection of *Xanthomonas arboricola* pv. *pruni* in *Prunus* species. *Applied and Environmental Microbiology* **77**, 89-97.

Palacio-Bielsa A, Lopez-Soriano P, Buhlmann A, van Doorn J, Pham K, Cambra MA, Berruete IM, Pothier JF, Duffy B, Olmos A & Lopez MM (2015) Evaluation of a real-time PCR and a loop-mediated isothermal amplification for detection of *Xanthomonas arboricola* pv. pruni in plant tissue samples. *Journal of Microbiological Methods* **112**, 36-39.

Park SY, Lee YS, Koh YJ, Hur JS & Jung JS (2010) Detection of *Xanthomonas arboricola* pv. *pruni* by PCR using primers based on DNA sequences related to the hrp genes. *The Journal of Microbiology* **48**, 554-558.

Picard D, Afonso T, Benko-Beloglavec A, Karadjova O, Matthews-Berry S, Paunovic SA, Pietsch M, Reed P, van der Gaag DJ & Ward M (2018) Recommended regulated non-quarantine pests (RNQPs), associated thresholds and risk management measures in the European and Mediterranean region. *EPPO Bulletin* **48**, 552-558. Available at https://rnqp.eppo.int/recommendations/

Pothier JF, Pagani MC, Pelludat C, Ritchie DF & Duffy B (2011) A duplex-PCR method for species- and pathovar-level identification and detection of the quarantine plant pathogen *Xanthomonas arboricola* pv. *pruni*. *Journal of Microbiological Methods* **86**, 16-24.

Ruiz C, Nadal A, Montesinos E & Pla M (2018) *Novel Rosaceae* plant elicitor peptides as sustainable tools to control *Xanthomonas arboricola* pv. *pruni* in *Prunus* spp. *Molecular Plant Pathology* **19**, 418-431.

Sabuquillo P & Cubero J (2021) Biofilm formation in *Xanthomonas arboricola* pv. *pruni:* structure and development. *Agronomy* **11**, 546

Scortichini M (2010) Epidemiology and predisposing factors of some major bacterial diseases of stone and nut fruit trees species. *Journal of Plant Pathology* **92**, 73-78.

Silva Vasconcellos F, de Oliveira A, Lopes-Santos L, Oliveira Beranger A, Torres Cely M, Simionato A, Pistori J, Spago F, de Mello J, San Martin J, Jesus Andrade C & Andrade G (2014) Evaluation of antibiotic activity produced by *Pseudomonas aeruginosa LV* strain against *Xanthomonas arboricola* pv. *pruni*. *Agricultural Sciences* **5**, 71-76.

Topp BL, Heaton JB, Russell DM & Mayer R (1989) Field susceptibility of Japanese-type plums to *Xanthomonas campestris* pv. *pruni*. *Australian Journal of Experimental Agriculture* **29**, 905-909.

Zaccardelli M, Malaguti S & Bazzi C (1998) Biological and epidemiological aspects of *Xanthomonas arboricola* pv. *pruni* on peach in Italy. *Journal of Plant Pathology* **80**, 125-132.

Zarei S, Taghavi SM, Hamzehzarghani H, Osdaghi E & Lamichhane JR (2018) Epiphytic growth of *Xanthomonas arboricola* and *Xanthomonas citri* on non-host plants. *Plant Pathology* **67**, 660-670.

Zarei S, Taghavi SM, Banihashemi Z, Hamzehzarghani H & Osdaghi E (2019) Etiology of leaf spot and fruit canker symptoms on stone fruits and nut trees in Iran. *Journal of Plant Pathology* **101**, 1133-1142.

Zarei S, Taghavi SM, Rahimi T, Mafakheri H, Potnis N, Koebnik R, Fischer-Le Saux M, Pothier JF, Palacio Bielsa A, Cubero J, Portier P, Jacques MA & Osdaghi E (2022) Taxonomic refinement of *Xanthomonas arboricola*. *Phytopathology* **112**, 1630-1639.

ACKNOWLEDGEMENTS

This datasheet was extensively revised in 2023 by Michiel J.C. Pel and Maria Bergsma-Vlami (NIVIP, Netherlands Institute for Vectors Invasive plants and Plant health). Their valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2026) *Xanthomonas arboricola pv. pruni*. EPPO datasheets on pests recommended for regulation. Available online. https://gd.eppo.int

Datasheet history

This datasheet was first published in the EPPO Bulletin in 1978 and revised in the two editions of 'Quarantine Pests for Europe' in 1992 and 1997, as well as in 2023. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

CABI/EPPO (1992/1997) *Quarantine Pests for Europe (1st and 2nd edition)*. CABI, Wallingford (GB).

EPPO (1978) Data sheets on quarantine organisms No. 62, *Xanthomonas pruni*. *EPPO Bulletin* **8**(2), 67-71. https://doi.org/10.1111/j.1365-2338.1978.tb02773.x

Co-funded by the European Union