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Data Sheets on Quarantine Pests

Xylophilus ampelinus

IDENTITY

Name: *Xylophilus ampelinus* (Panagopoulos) Willems *et al.*
Synonyms: *Xanthomonas ampelina* Panagopoulos
Taxonomic position: Bacteria: Gracilicutes
Common names: Bacterial blight (English)
Nécrose bactérienne de la vigne (French)
Tsilik marasi (Greek)
Notes on taxonomy and nomenclature: The disease attributed to *X. ampelinus* was first described in Crete (Greece) (Panagopoulos, 1969). The "maladie d'Oléron", described in France in 1895 (Ravaz, 1895) and attributed to *Erwinia vitivora*, has now been shown also to be due to *X. ampelinus* (Prunier *et al*., 1970). *E. vitivora* is simply thought to be a form of the saprophyte *Erwinia herbicola*. "Vlamsiekte" in South Africa, previously considered to be the same disease as the maladie d'Oléron, is now also recognized to be due to *X. ampelinus* (Matthee *et al*., 1970; Erasmus *et al*., 1974). The same is true of "mal nero" in Italy (Grasso *et al*., 1979). Recent DNA and RNA structure studies have, however, shown that it belongs to the third rRNA superfamily where it forms a separate branch, now referred to the genus *Xylophilus* (Willems *et al*., 1987).
Bayer computer code: XANTAM
EPPO A2 list: No. 133
EU Annex designation: II/A2

HOSTS

Grapevines are the only known host.

GEOGRAPHICAL DISTRIBUTION

EPPO region: Authentic *X. xylophilus* is known from France, Greece, Italy, Moldova, Portugal (unconfirmed), Slovenia, Spain and Turkey (eradicated). Symptoms attributed to *E. vitivora* were at one time reported from Bulgaria, Switzerland, Tunisia, Yugoslavia; the present status of these reports is uncertain.
Asia: Turkey (eradicated).
Africa: South Africa, Tunisia (status uncertain).
South America : Symptoms attributed to *Erwinia vitivora* were at one time reported from Argentina; the present status of this report is uncertain.
EU: Present.
Distribution map: See CMI (1986, No. 531).

BIOLOGY

The life-cycle of *X. ampelinus* has not been completely elucidated. Primary infections occur mainly on shoots 1 or 2 years old, via leaves, blossoms and grapes. The pathogen is also readily transmitted with pruning tools (Ridé *et al*., 1977) and enters healthy tissues mainly through pruning wounds, especially in wet and windy weather. The bacteria then spread to other shoots in the early summer. The disease is associated with warm moist conditions, and spread is favoured by overhead sprinkler irrigation. The bacterium is able to survive in the wood, and thus may be transmitted from nursery to nursery in infected cuttings. From initial disease foci, local spread in vineyards tends to occur along the rows. It may also be carried in irrigation water used to control *Viteus vitifoliae* (EPPO/CABI, 1996).

DETECTION AND IDENTIFICATION

Symptoms

On shoots

Symptoms are observed in early spring to June. Infection usually occurs on the lower two to three nodes of shoots that are 12-30 cm long, and spreads slowly upward. Initially, linear reddish-brown streaks appear, extending from the base to the shoot tip; then, more or less lens-shaped cracks and cankers develop, sometimes as deep as the pith. No wound response is observed. Shoots subsequently wilt, droop and dry up. On very young shoots discoloration is less common and the whole shoot dies back. In cases of severe infection, a large number of adventitious buds develop, but these quickly die back. Infected shoots are shorter, giving the vine a stunted appearance. Cross-sections of stems will reveal browning of the tissues. Stalks of grape bunches exhibit symptoms similar to the shoots on infection.

On leaves

Leaves may be penetrated via the petiole and then the veins, in which case the whole leaf dies. Alternatively, leaves are penetrated directly via the stomata, with development of angular, reddish-brown lesions. When infection occurs through the hydathodes, reddish-brown discolorations develop on the leaf tips. Light-yellow bacterial ooze may be seen on infected leaves when humidity is high.

On flowers

Flowers which have not reached maturity turn black and die back.

On roots

Roots may also be attacked, resulting in retardation of shoot growth, whether the plant is grafted or on its own rootstock.

Morphology

X. ampelinus is a Gram-negative rod with one polar flagellum. In culture, at 25°C, growth is slow; non-mucoid, smooth, yellow, round, entire colonies, 0.4-0.8 mm in diameter, develop in 6-10 days on yeast-glucose-chalk agar which is a favourable growth medium (Bradbury, 1991).

Detection and inspection methods

Standard bacteriological tests and three serological techniques for rapid identification of *X. ampelinus* are described by Erasmus *et al*. (1974). The bacterium can be detected by immunofluorescent microscopy in washings from diseased leaves or in homogenates of woody tissues, as well as in ooze or on pruning shears (Ridé *et al*., 1977). The bacterium may be found in stems and leaves up to 10 cm (or even 40 cm) above visibly infected areas.

The detection of the bacterium via ELISA has not yet proved successful (Lopez *et al.*, 1987).

MEANS OF MOVEMENT AND DISPERSAL

Natural dispersal is limited to the vineyard and immediately surrounding area. In international trade, *X. ampelinus* is liable to be carried on infected grapevine planting material.

PEST SIGNIFICANCE

Economic impact

Severe infection of susceptible cultivars can lead to serious harvest losses. In 1940, Du Plessis observed harvest losses of 70% and more in South Africa. Vines infected one year deteriorated and died back in subsequent years. Since 1956, however, the disease has only appeared sporadically in South Africa and, where controlled by copper sprays, is of no economic importance.

In France, since 1968, serious damage has been reported, particularly on Alicante-Bouschet and Ugni Blanc vines in Charente, and on Grenache and Maccabeu in Languedoc. Vines growing on their own roots in the irrigated areas around Narbonne are most severely affected. The disease is also of increasing importance in Spain (Lopez *et al.*, 1980).

In Greece, the disease is widespread in Crete, especially in Iraklion county, where it occurs mainly on the very susceptible cultivar Sultanine. It has recently spread to some other Aegean islands. On the mainland, where it was previously limited to the Kynegos area in the South Peloponnesos on cv. Corinthe noir, it has recently appeared in two of the best grape-growing countries in West Peloponnesos, where large areas of this economically important cultivar are threatened.

The presence and possible importance of *X. ampelinus* needs to be checked in countries or regions where the maladie d'Oléron was reported earlier.

Control

Control can be obtained only through viticultural practices. Chemicals have failed to control the disease (Panagopoulos, 1987). Infected shoots should be destroyed. Pruning should be carried out in dry weather and as late as possible. All pruning tools should be thoroughly disinfected during the operation. Overhead sprinkler irrigation should not be used.

Phytosanitary risk

X. ampelinus is an EPPO A2 quarantine organism (OEPP/EPPO, 1984) and is also of quarantine significance for NAPPO and the IAPSC. There is an obvious danger that the disease will spread into areas previously not affected by the bacterium. Further spread could lead to severe economic losses, especially since no efficient control measures are known.

PHYTOSANITARY MEASURES

Direct inspection of imported planting material is unlikely to be reliable, so if material is imported from areas where the disease is known to occur, nursery inspections are necessary. Plants for planting should come from an area where *X. ampelinus* does not occur

or the consignment should come from mother plants which have been tested against *X. ampelinus* by an EPPO-approved method (OEPP/EPPO, 1990).

The development of grapevine certification schemes within EPPO will give additional guarantees for grapevine planting material.

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