

Data Sheets on Quarantine Pests

Apple mosaic ilarvirus in *Rubus***IDENTITY**

Name: Apple mosaic ilarvirus

Taxonomic position: Viruses: Bromoviridae: *Ilarvirus*, subgroup 3

Common names: ApMV (acronym)

None used for disease caused by ApMV in *Rubus*

Notes on taxonomy and nomenclature: Some authors have considered ApMV to be a strain of prunus necrotic ringspot ilarvirus. This view is not accepted here. In any case, the virus infecting *Rubus* is of the ApMV type.

EPPO computer code: APMXXX

EPPO A2 list: No. 149

EU Annex designation: II/A1 - as Prunus necrotic ringspot virus

HOSTS

ApMV is common in crop plants in the Rosaceae worldwide (Fulton, 1972), but occurs rarely in *Rubus* in the EPPO region.

GEOGRAPHICAL DISTRIBUTION

EPPO region: Widespread, but detected in *Rubus* only in *R. idaeus* in Germany (Baumann *et al.*, 1982; Baumann, 1984); ApMV is not thought to have established in *Rubus* in Germany. Intercepted in the UK (Scotland).

North America: Widespread in *R. idaeus*, *R. occidentalis* and *R. ursinus* in Canada and USA (Converse & Casper, 1975; Baumann *et al.*, 1982).

EU: Present.

Distribution map: See CMI (1963, No. 354). This gives the world distribution in all hosts, not only in *Rubus*.

BIOLOGY

Many ApMV isolates occur that differ in serological properties and symptoms in herbaceous test plants (Fulton, 1972; Casper, 1973). Some isolates are related serologically to prunus necrotic ringspot ilarvirus (PNRSV) (Fulton, 1972; Casper, 1973), and the two viruses have been regarded as forms of the latter. This led EPPO to make the original A2 list entry as PNRSV in *Rubus*.

Other ilarviruses are seed-borne and some, such as PNRSV (to which ApMV is related), are pollen-transmitted to the plant pollinated (Fulton, 1983). No information is available on seed or pollen transmission of ApMV in *Rubus*. The virus is transmitted with difficulty by mechanical inoculation of sap from woody plants to several herbaceous species, provided an anti-oxidant is included in the extraction medium (Fulton, 1972).

DETECTION AND IDENTIFICATION

Symptoms

ApMV is symptomless in *Rubus*.

Morphology

The quasi-isometric particles of several isolates of ApMV have been purified and studied (Fulton, 1972).

Detection and inspection methods

As most plants are symptomlessly infected, testing by mechanical inoculation of sap to herbaceous indicator plants is necessary. Like black raspberry latent ilarvirus (EPPO/CABI, 1996b), ApMV is erratically distributed in some hosts (Fulton, 1972) so that test samples should be taken from several positions on the plant. The extraction buffer should be of pH 8-9 and contain an antioxidant. Definitive identification can only be made serologically. As several serological variants of ApMV are known, antisera to several strains should be used (Fulton, 1972; Casper, 1973). Inspection and test methods are also presented in OEPP/EPPO (1991).

MEANS OF MOVEMENT AND DISPERSAL

ApMV has no natural vector, but is dispersed by human movement of infected plants. Propagation of imported *Rubus* would be the practical means of establishment of ApMV in this crop in the EPPO region. In view of the characteristics of other ilarviruses, it is possible that ApMV could be introduced in *Rubus* seed, or dispersed by pollen from imported infected *Rubus* plants.

PEST SIGNIFICANCE

Economic impact

Most infected *Rubus* plants in North America are symptomless but some *R. idaeus* plants in Germany showed conspicuous yellow speckling and/or line patterns (Baumann *et al.*, 1982). No studies have been made on the effect of ApMV on growth and yield, and there is no reason to suppose that it has more than an insignificant economic impact.

Control

Healthy planting material should be used, based for example on the virus-free certification scheme for *Rubus* developed by OEPP/EPPO (1994).

Phytosanitary risk

The EPPO A2 quarantine list includes three pollen-borne viruses of *Rubus* (OEPP/EPPO, 1986). Of these, ApMV, like cherry leafroll nepovirus (EPPO/CABI, 1996a) is widespread in Europe but hardly found in *Rubus* there. So European *Rubus* can probably only become infected by ApMV by pollen transmission from infected *Rubus* from non-EPPO regions. Black raspberry latent ilarvirus, the third virus concerned, does not occur in the EPPO region at all (EPPO/CABI, 1996b).

It may be noted that ApMV is in itself an insignificant pest of *Rubus*. The decision to consider it as a quarantine pest was partly based on the possibility of synergistic effects in mixed infections but mainly on the wish of certain EPPO countries to produce and maintain virus-free *Rubus*. This could probably be achieved as successfully by using normal certification, following for example an adaptation of the scheme proposed by OEPP/EPPO (1994). It may be noted that the pollen transmissibility of ApMV in *Rubus* is conjectural, based on the analogy with other ilarviruses (see Biology).

PHYTOSANITARY MEASURES

Plants of *Rubus* from countries where ApMV occurs in *Rubus* should come from a reliable certification scheme, in which particular attention has been paid to preventing pollen-transmitted reinfection. Standard methods for eliminating viruses can be used for nuclear stock of *Rubus*; for example, meristem-tip culture readily eliminates ApMV (Theiler-Hedtrich & Baumann, 1989).

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