Peach Rosette Mosaic Virus in Highbush Blueberry

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ABSTRACT

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Jersey and Berkley highbush blueberry cultivars that had been planted as rooted cuttings in 1975 beneath a canopy of Concord grapevines infected with peach rosette mosaic virus were indexed positive for the virus on *Chenopodium quinoa* in 1978. Two years later, symptoms appeared on Jersey bushes as elongated, strap-shaped or as malformed, crescent-shaped leaves on portions of the bushes; on Berkley bushes, several of the terminal leaves were spoon shaped.

Peach rosette mosaic was originally described as a disease of peach (*Prunus persica* Batsch) (1,6). Later, the peach rosette mosaic virus (PRMV) was shown to cause "decline" disease of Concord grape (*Vitis labrusca* L.) (2,3,8,9). The disease occurs in vineyards throughout southwestern Michigan. PRMV, a member of the nepovirus group (2), is transmitted by *Xiphinema* spp. (2,3), and it is also spread via propagating wood. The virus is seedborne in grape and certain weeds (9).

Of the approximately 4,050 ha of highbush blueberries (*Vaccinium corymbosum* L.) grown in Michigan, about 20% are produced in the grape-growing area where PRMV is endemic. Six major virus or viruslike diseases have been described as economically important in highbush blueberry culture, including two caused by the nepoviruses, tomato and tobacco ringspot (12). More recently, a third putative member of the nepovirus group, blueberry leaf mottle virus, was described as a serious pathogen of blueberry (10).

Because PRMV is a serious and widespread pathogen of grape in Michigan, we investigated the possibility that it is a potentially serious pathogen of highbush blueberry under field conditions.

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MATERIALS AND METHODS

For these studies, we used a Concord vineyard near Lawton, MI, that contained numerous vines infected with PRMV as confirmed by indexing on *Chenopodium quinoa* or by enzyme-linked immunosorbent assay (ELISA) (7). During the summer of 1975, six 2-yr-old, healthy, rooted cuttings each of Jersey and Berkley blueberry were planted beneath two adjacent PRMV-infected grapevines. An equal number of healthy blueberry plants were planted beneath two grapevines several rows away that were found to be free of PRMV by indexing on *C. quinoa*. The population of *X. americanum* (adults and larvae) before planting was 36/100 cc of soil, as determined by the Jenkins sugar flotation method (4).

Beginning in the summer of 1976, we collected 1 g or less of young terminal leaf tissue from each blueberry plant and ground it in several ml of 0.01 M phosphate buffer, pH 7.2, containing 2% (v/v) of nicotine alkaloid. It was then rub-inoculated onto Carborundum-dusted leaves of *C. quinoa* plants. Resulting PRMV infections were confirmed by agar gel diffusion or ELISA tests (7) with PRMV antiserum.

RESULTS AND DISCUSSION

In 1978, two of six Berkley and one of six Jersey bushes tested positive for PRMV infection by assay on *C. quinoa*. In 1980, four of six Berkley and three of six Jersey plants tested positive for infection using ELISA tests. None of the plants growing beneath healthy vines tested positive for PRMV infection.

Symptoms were first noticed in 1980 on bushes planted under vines diseased with PRMV and were more pronounced on Jersey than on Berkley cultivars. In general, leaves on diseased bushes were somewhat strap shaped or were malformed in a crescentlike shape; they were not

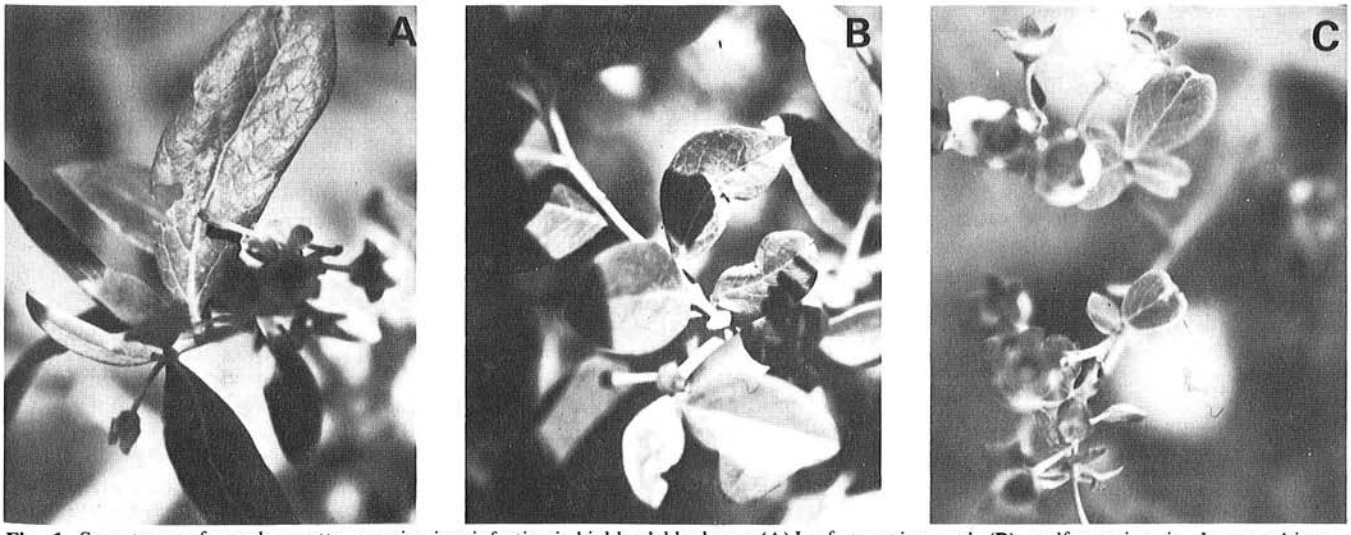

Fig. 1. Symptoms of peach rosette mosaic virus infection in highbush blueberry: **(A)** Leaf strapping and **(B)** malformation in Jersey cultivar. **(C)** Spoon-shaped leaves on terminal growth of Berkley cultivar.

uniformly distributed over the entire bush. Many of the leaves on infected Jersey plants were narrow and elongated (Fig. 1A and B), while those on Berkley were spoon shaped (Fig. 1C). Only a few terminal leaves showed these symptoms. The necrotic or chlorotic leaf lesions or rosetting characteristic of tobacco (11,12) and tomato ringspot virus infections (5) did not occur, nor did the mottle associated with blueberry leaf mottle disease (10). No twig or fruit symptoms were observed. We did not measure yields because the bushes did not have time to mature. All control bushes were free of symptoms.

PRMV caused a potentially serious disease of highbush blueberry under field conditions. The nematode vector, *X. americanum*, is ubiquitous in blueberry plantings but usually occurs in very low populations (1–2 adults or nymphs per 100 cc of soil). In addition to its importance to commercial blueberry growers in Michigan, PRMV should be considered a possible contaminant of propagating wood. We suggest the inclusion of PRMV in the virus testing of clean stock programs involving blueberry.

The symptoms described for PRMV infection of blueberry should not be considered diagnostic. Any bushes suspected of having the disease should be indexed on *C. quinoa*, followed by serologic confirmation or testing by ELISA.

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