

***Alternanthera Mosaic Virus in Portulaca species*¹**

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INTRODUCTION: *Portulaca* species include common world-wide weeds and hardy, heat-tolerant, sun-loving summer annuals propagated in U.S. greenhouses as transplants for flower beds, rock gardens and patio baskets. Their vibrantly colored blooms highlight warm and dry landscapes and also make attractive additions to a butterfly garden. In the Middle East, Asia and Europe, non-cultivated forms of purslane (*P. oleracea* L.) are harvested and used as edible vegetables, preferably for their leaves and tender tips which are likened in taste to the potherb, watercress (Bailey and Bailey 1978).

SYMPTOMS: Stunted plants of two species of ornamental *Portulaca* with irregular leaf margins and foliar chlorotic mottling were sent to the Division of Plant Industry in 1995 (Fig. 1). *Portulaca* hybrids with similar symptoms had been reported in Kentucky and Kansas in 1995 (Eshenaur *et al.* 1995). The later plants were diagnosed with a potexvirus.



Fig. 1. *Portulaca* species infected with *Alternanthera mosaic potexvirus*. (Note chlorotic blotch and irregular leaf margins.)

VIRUS DETECTION: Like the samples from Kansas and Kentucky, electron microscopic examination of sap from leaves of the infected *Portulaca* plants from Florida revealed many filamentous virus particles that suggested infection with a potexvirus. In serological tests (ELISA) the samples from all three states reacted positively to antiserum to the potexvirus, *Papaya mosaic virus* (PapMV).

In 2005, a potexvirus that reacted with PapMV antiserum was found in another host in Florida. Further tests with this host and two other hosts, including an infected *Portulaca* species with symptoms like those seen in 1995, indicated that while this potexvirus was related to PapMV, it was not PapMV. Sequencing data showed that the virus was actually *Alternanthera mosaic virus* (Baker *et al.* 2006).

VIRUS DISTRIBUTION AND HOST RANGE: *Alternanthera mosaic virus* (AltMV) was first identified in Queensland, Australia in 1999 in an infected plant of *Alternanthera pungens* (Amaranthaceae), a weed found in both the southern U.S. and Australia. AltMV is serologically closely related to *Papaya mosaic virus* (PapMV) but at the nucleotide level it is only 79.8% identical

to PapMV (Gerring and Thomas 1999). AltMV has since been identified in several different ornamental plants in the United States (Hammond *et al.* 2005, Lockhart, 2008), Italy (Ciuffo and Turina 2004), and Brazil (Duarte *et al.* 2008). The known ornamental hosts of this virus now include phlox (*Phlox stolonifera*), skullcap (*Scutellaria* sp.), firecracker plant (*Crossandra infundibuliformis*) and angelonia (*Angelonia angustifolia*) as well as *Portulaca*. In Brazil, it has also been identified in *Torenia* species, *Helichrysum* species and *Salvia splendens*. *Angelonia*, *Salvia* and *Torenia* species showed no obvious symptoms.

Host range studies indicate that some isolates of this virus can systemically infect tomatoes (*Lycopersicon esculentum*), faba beans (*Vicia faba*), sunflowers (*Helianthus annuus*), and Zinnias (*Zinnia elegans*). Some cultivars of watermelon (*Citrullus lanatus*), cucumbers (*Cucumis sativus*), and blackeyed peas (*Vigna unguiculata*) also became systemically infected. Many of these plants showed mild symptoms or were asymptomatic. The virus does not seem to infect papaya (*Carica papaya*).

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DISEASE DEVELOPMENT: In general, potexviruses are naturally transmitted without a vector. They are readily sap transmissible (Renate and Lesemann 1978) and are easily spread by plant contact, vegetative propagation and contaminated tools and hands. Some have been shown to retain infectivity in plant sap for several months at room temperature. Potexviruses are not transmitted by seed or pollen.

CONTROL: Control virus spread by rouging all symptomatic plants. Avoid pruning healthy plants with tools that may have contacted infected plants. Sterilize pots, tools and benches that may have come in contact with diseased plants using 0.5% a.i. sodium hypochlorite (10% household bleach). The latter recommendations are particularly important since many of the known hosts of this virus do not show obvious symptoms. Plants suspected of harboring a virus should be sent to a plant diagnostic laboratory for testing.

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