

Leaf Variegation with Ring Spots

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A TRANSMISSIBLE disease of citrus, characterized by marked yellowish variegation of mature leaves, was observed in a few sweet orange trees in the citrus area of Valencia. Eight trees of Sanguinelli in 2 orchards, 1 of Salustiana, and 1 of Comuna were found with symptoms.

SYMPTOMATOLOGY.—The yellowish variegation stands out very clearly on both upper and lower surfaces of leaves, although the yellow color is lighter on the lower surface. The yellow areas are irregular in size and shape, sometimes the small ones being more or

less circular in outline and having a green center so as to resemble a ring spot (Fig. 1). A yellow oak-leaf pattern sometimes develops along the midrib.

Variegated leaves are irregularly distributed over the tree. Some branches have only normal leaves. In the diseased Comuna tree, only 1 branch had variegated leaves. The severest symptoms develop on the vigorous shoots that grow from the lower part of the trunk.

Yellow spots sometimes develop on the twigs that bear variegated leaves. The yellow spots and the midribs of affected leaves are occa-

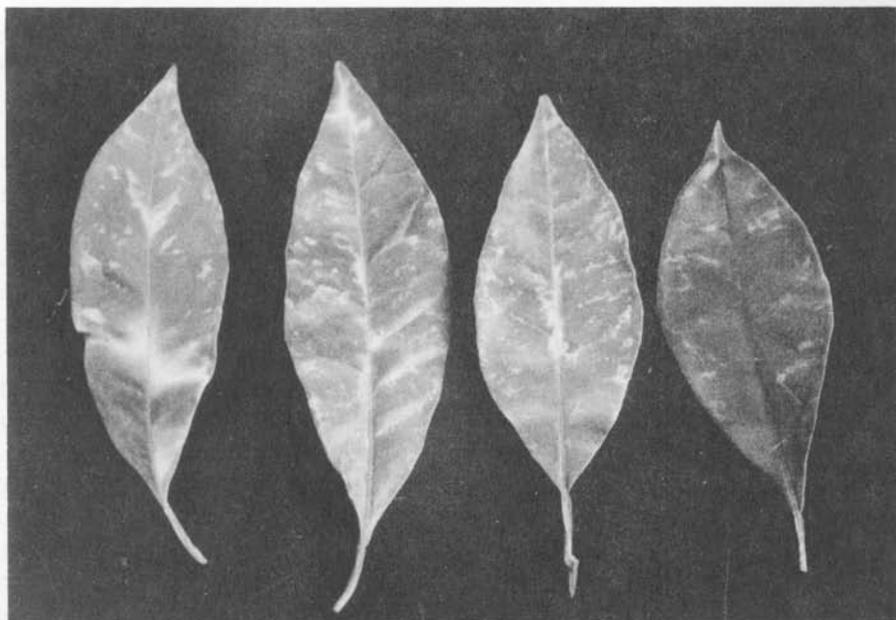


FIGURE 1. Symptoms of leaf variegation with ring spots on leaves of the Sanguinelli variety of sweet orange.

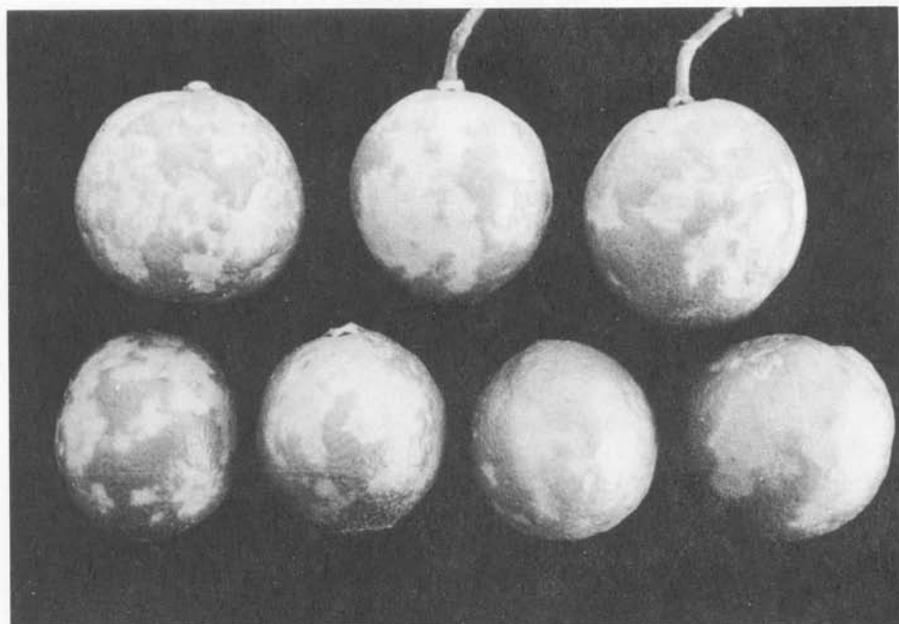


FIGURE 2. Fruit from trees affected by leaf variegation with ring spots, showing yellow depressed areas.

sionally colored with gum. Fruit on branches with variegated leaves develop slight depressions or furrows, yellow in color (Fig. 2).

TRANSMISSION.—Buds were taken from 3 different sources from branches with variegated leaves, and each source was grafted into 3 sweet orange, 3 sour orange, and 3 West Indian lime seedlings. The first symptoms appeared in a sweet orange seedling 2½ months after it was inoculated, and soon thereafter in 2 West Indian lime test plants. The sour orange seedling showed no symptoms. The symptoms developed in a few leaves, better on shoots growing below the point of inoculation than above. They consisted of irregularly shaped spots and oak-leaf patterns, which sometimes covered a large part of the leaves.

CONCLUSIONS. — Transmission from diseased to healthy plants demonstrates the infectious nature of this disease, despite the fact that the percentage of infection in the test plants was very low. The symptomatology of the disease suggests that the infectious agent is a virus.

The irregular distribution of affected leaves both on orchard trees and test seedlings suggests an irregular distribution of the causal agent in the plant.

The symptomatology of the disease and the transmissibility of the infectious agent suggest that the malady is closely related to, or identical with, the ring spot described by Wallace and Drake (2) in California and "La maculatura anulare" described by Catara and Grasso (1) in Sicily.

Literature Cited

1. CATARA A., and GRASSO, S. 1968. Una nuova virosi degli Agrumi per l'Italia: "La maculatura anulare" ("Ring spot"). Riv. Pat. Veg. Serie 4, 4: 261-66.
2. WALLACE, J. M., and DRAKE, R. J. 1968. Citrange stunt and ringspot, two previously undescribed virus diseases of citrus, p. 177-83. In J. F. L. Childs (ed.), Proc. 4th Conf. Intern. Organization Citrus Virol. Univ. Florida Press, Gainesville.