The Virus Disease Situation in Greek Citriculture

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Since 1963 many observations have been made of young leaf symptoms of the psorosis group of viruses on citrus trees in Greece. Some symptoms are found on almost all sweet orange trees throughout the country and in all commercial varieties such as Washington navel, Jaffa, common orange, Navelina, etc. This is also the case with mandarin trees including different local cultivars of the common variety. However, lemon trees very rarely show the characteristic symptom for psorosis, pinpoint spotting on leaves of all ages. The above three species constitute the majority of citrus trees cultivated in Greece. All are grafted on sour orange rootstocks, because of the *Phytophthora* threat.

The so-called young leaf symptoms, appearing on immature leaves in late spring as well as on the autumn flushes, consist of faint fleckings parallel to veinlets, of clearing not coinciding exactly with veinlets, and of oak-leaf patterns running symmetrically on both sides of the midrib.

As far as individual psorosis viruses or virus strains are concerned, all six well-known psorosis diseases are found in Greece, each in a different amount but mostly to a minor extent. Psorosis A has been found in only one place, on some mandarin trees at Nea Epidavros in the Argolis area (Zachos and Gakiopoulos, 1963). Psorosis B was found on Washington navel sweet orange trees in the village of Agia Trias, Argolis district (Demetriades, 1971). Recently the writer found, for the first time, concave gum and blind pocket on rather old mandarin trees at some villages, especially Drepanon, on the south coast of the Argolis district near Nafplion. As shown by figs. 1 and 2, trunks and main branches with concave gum disease have more or less wide and shallow cavities, whereas trunks with

Fig. 1. Mandarin tree affected by concave gum disease. Two blind pockets also appear on the left side of the trunk.

Fig. 2. Mandarin trunk with blind pockets of psorosis.

blind pocket have narrow longitudinal channel-like depressions. Neither exudation of gum nor scaling of the external bark layers occurred except in one location in the village of Kallithea where infected Washington navel orange trees showed open gum pockets at the edges of cavities.

The fact that concave gum and blind pocket diseases occur mainly on mandarin trees may be accounted for by their greater susceptibility than sweet orange or lemon trees to the corresponding viruses. On the other hand, the trunk form of these diseases appears only on the oldest trees growing in the three major citrus areas: Argolis, Arta, and Laconia, and especially on those trees planted before the second world war. This explains why concave gum and blind pocket are so rare in the whole country, as shown by the intensive search made for them for several years. Indeed, most citrus trees in Greece are less than 30 years old.

Crinkly leaf and infectious variegation were detected in two samples of lemon leaves, var. Maglini, from Poros of Triginia. The two symptoms were mixed in these samples.

Impietratura has been observed by the writer since 1963 on sweet orange trees of different varieties but most frequently on Washington navel trees (Zois, 1968). This disease occurs in the plain of Argos, where it constitutes a serious problem, as well as on the island of Crete in the region of Chania, and in the Arta area.

Exocortis virus apparently occurs extensively in Greece, but it is latent because of the exclusive use of sour orange rootstock which is tolerant to both *Phytophthora* and exocortis virus. In one greenhouse experiment at the Plant Pathology Investigation and Quarantine Station at Aspropirgos, sweet orange trees of the varieties Washington navel, Valencia late, and Sanguine grown in the Station fields were indexed on rough lemon seedlings on which buds from Etrog citron USDCS 60-13 were grafted as indicators. Ten out of 15 trees indexed were found infected by exocortis virus. Similar results have been reported from indexing done at the Arboriculture Station of Poros (Keramidas, 1974).

Xyloporosis has been found on common mandarin trees on sour orange rootstock in one orchard in the village Karnezaika in the Argolis district. The trees are rather young and, due to the susceptibility of mandarin and the tolerance of sour orange, symptoms appear only on the mandarin portion of the tree near the bud union (fig. 3). There is some shelling of surface layers of bark while the bark itself is impregnated with gum deposits, islet-like and brown. The wood surface, revealed by removing rectangular pieces of bark, exhibits lens-shaped pits and channels into which pegs of the inner bark fit.

Fig. 3. Mandarin tree with shelling of of the outer bark, just above the bud union, caused by xylopososis virus infection.

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