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Aulacorthum solani as a vector of tulip breaking virus – a cautionary tale

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In the course of present research it was discovered that a breeding program for resistance to tulip breaking virus (TBV) (Van Eijk, 1984) has, since 1979, probably relied on mixed populations of *Aulacorthum solani* (Kalt.) and other aphid species, including probably *Macrosiphum euphorbiae* (Thos.), as vectors while it was thought that only *M. euphorbiae* was being used. The aphid species identification had never been verified. A large sample of individuals from the present 'colony' were determined to be all *A. solani* (H.C. Burger, Plant Protection Service, Wageningen). Now it is unclear when the aphid colony, which was begun about five years ago, became all or partly *A. solani.*

It appears from these findings that *A. solani* probably is a vector of TBV, albeit not a very good one (as was reported in an obscure reference by Van Slogteren and De Bruyn Ouboter, 1941). This is contrary to journal reports that this species does not transmit TBV (Brierley and McKay, 1938; Brierley and Smith, 1944). The present species identification check may explain why in recent research using this 'colony' often there was poor transmission even to varieties known to be susceptible (Van Eijk, 1984, and unpublished data). Those studies concluded that some tulip varieties were resistant to inoculation by aphids. Whether those varieties actually are aphid-inoculation-resistant is now unclear.

This unhappy discovery illustrates the need for verification of species identification as a prerequisite for using an insect in any research. In particular, this is essential when using an aphid as a vector in virus transmission studies, since many aphid species are difficult to distinguish and may reproduce on the same host. Kennedy et al.(1962) stressed the importance of identification and preservation of a sample of individuals from any colony used in virus transmission research. In addition, identification should be rechecked periodically in the course of that work. Contamination of the colony can thus be recognized and corrected in a timely manner.

Lack of initial species determination by a taxonomist and careful colony maintenance can lead to a number of problems. One is that transmission may be attempted with a species which is at best a poor vector, at worst, not a vector at all, and certainly not the one that was thought to be used. With the considerable lag time between inoculation and detection of infection in some plant species, large amounts of research effort can be wasted. Another problem is than erroneous information about

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transmission and the effects on transmission of various plant and environmental conditions may enter the literature. This may cost future researchers considerable effort and frustration trying to reconcile what appear to be contradictory findings.

Documentation with voucher specimens also provides protection in the event of future reclassification of species or subspecies. This is crucial if what was believed to be one species is later split into two. The question then arises: which of the two was used in earlier work? Documentation and preservation of specimens will help avoid invalidation of work due to uncertainties concerning the identification of the species used.

References

Brierley, P. & McKay, M.B., 1938. Experiments with aphids as vectors of tulip breaking. Phytopathology 28: 123-129.

Brierley, P. & Smith, F.F., 1944. Studies on lily virus diseases: the mottle group. Phytopathology 34: 718-746.

Eijk, J.P. van, 1984. Componenten-analyse bij de veredeling op resistentie tegen mozaïekvirus in tulp. Bedrijfsontwikkeling 15: 81-82.

Kennedy, J.S., Day, M.F. & Eastop, V.F., 1962. A conspectus of aphids as vectors of plant viruses. Commonwealth Institute of Entomology, London, 114 pp.

Slogteren, E. van & Bruyn Ouboter, M.P. de, 1941. Onderzoeking over virusziekten in bloembolgewassen. II. Meded. Landbouwhogeschool 45, 4. 54 pp.