

Evidence for the presence of the Ohio strain III of tobacco mosaic virus in tomato in The Netherlands

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Breeding for resistance to tobacco mosaic virus (TMV) in tomatoes in The Netherlands started from tomato selections known to be resistant to the four strains of TMV found in Ohio, U.S.A. (cf. McRitchie and Alexander, 1963). For testing purposes it was necessary to find Dutch isolates with a similar host range as these so-called Ohio strains.

Rast (1967) demonstrated the existence of differences in aggressiveness between TMV isolates on identical populations of clones made out of a selection of *Lycopersicum peruvianum* P.I. 128655. Only a few isolates infected a sufficiently large proportion of the clones to suggest a close relationship to the Ohio strain IV. Most isolates, however, infected only those clones which apparently were generally susceptible to all isolates tested. As long as no other differential hosts had been tested it remained doubtful whether these isolates would be even distantly related to the Ohio strain III (cf. Alexander, 1962).

Therefore an entirely new experiment was started in 1968 in which the host range was extended to include *Solanum pennellii*, the *L. esculentum* selection CStMW-18 and selections of *L. peruvianum* P.I. 128655 and P.I. 128650. These differential hosts, represented by five clones each, have meanwhile been tested with 70 TMV-isolates in total. From the preliminary results the reactions with six isolates have been selected as being typical of three groups of isolates differing in aggressiveness. Symptomatically the six isolates represent the green tomato and yellow ringspot strains of TMV, abbreviated as GL and YRL respectively in Table 1. The isolates 1 and 2 represent by far the largest group of isolates which infect only the generally susceptible clone number 13. Some isolates of this group also infect a number of clones of *S. pennellii* and/or *L. esculentum* CStMW-18 as symptomless carriers. The isolates 3 and 4, however, cause a clearly visible mosaic on all clones of these two differential hosts and in this respect are still exceptional cases. It is of interest to note that both isolates were obtained from separate leaf samples of susceptible tomato varieties. In fact isolate 3 has been the author's standard tomato strain since 1962. Its different reaction on *S. pennellii* was reported previously (Rast, 1966). Isolate 4 is a more recent accession and was not under investigation until 1967. Isolates 5 and 6 represent a rather small group of isolates which infect only the greater part of the *L. peruvianum* P.I. 128655 clones. In

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Table 1. Differentiation of TMV isolates on clones of *Solanum pennellii*, *Lycopersicum esculentum* and *L. peruvianum*.
+ = susceptible; t = tolerant; — = resistant.

Strain*	Isolate no.	S. pennellii						L. esculentum CStMW-18						L. peruvianum P.I. 128655						L. peruvianum P.I. 128650					
		Clone no.: 1 2 3 4 5						6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
GL	1	t	—	—	—	t	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—		
YRL	2	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—		
GL	3	+	+	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—	—	—	—	—	—		
YRL	4	+	+	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—	—	—	—	—	—		
GL	5	—	—	—	—	—	—	—	—	—	—	+	—	—	—	+	+	—	—	—	—	—	—		
YRL	6	—	—	—	—	—	—	—	—	—	—	+	—	—	—	+	+	+	—	—	—	—	—		

* For explanation see text

Tabel 1. Differentiatie van TMV-isolaten op klonen van *Solanum pennellii*, *Lycopersicum esculentum* en *L. peruvianum*.
+ = vatbaar; t = tolerant; — = resistent.

this group no symptomless carriers have yet been found among the clones of *S. pennellii* and *L. esculentum* CStMW-18. The present results with the isolates 5 and 6 confirmed those obtained in a previous experiment.

In conclusion it can be stated that the results obtained so far indicate the existence of at least three groups of TMV isolates with different aggressiveness. The first group roughly corresponds with the Ohio strains I and/or II despite certain symptomatological discrepancies. The third group is closely related to the Ohio strain IV although this strain is known to cause symptomless infection of *L. esculentum* CStMW-18. The second group of two isolates is the most interesting as their visible reaction on *L. esculentum* CStMW-18 is characteristic for the Ohio strain III. It should be stressed again that these isolates originated from common susceptible tomato varieties.

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Samenvatting

Aanwijzingen voor de aanwezigheid van de Ohio stam III van tabaksmozaïekvirus in tomaat in Nederland

Er zijn aanwijzingen dat Nederlandse TMV-isolaten van tomaat in drie groepen kunnen worden ingedeeld naar de mate van agressiviteit op klonen van verschillende differentiërende waardplanten. De reacties van deze groepen komen overeen met die van de vier in Ohio (U.S.A.) beschreven stammen van het virus. De tweede groep wordt nauw verwant geacht met de hier niet eerder gevonden Ohio-stam III.

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