Whitefly's (*Bemisia tabaci*) biotypes: phylogenetic, morphology and efficient as a vector of TYLCV in Syria

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Abstract

Over the past years, ***Bemisia tabaci*** have been studied in Syria. Recently results showed the existence of four biotypes common in Syria, nonB biotype at greenhouse, Q and B biotypes at Fields (<400m), and M biotype at mountains (400-1200m). Bootstrap value obtained by mtCOI technique was between 59-100%. A biotypes were characterized morphologically. There was insignificant difference between (M&Q) or (B&nonB) biotypes. whereas M biotype prevailed on B and nonB biotypes in most morphometric parameters. Margin Body was crenulated at local biotypes (M, Q, B & nonB), and the same for Operculum visaform which was semicircular. Local biotypes were arranged according to morphometric parameters as follows; M > Q > B = nonB. The results also showed that B biotype, in field conditions, is dominant when compared with other biotypes, with an infection percentage 88% and a disease severity 92%, and it was the most efficient biotype tested in the transmission of TYLCV under field conditions. While under greenhouse conditions, the non-B biotype was the most efficient in transmitting the virus with an infection percentage 92% and a disease severity 94%. Whereas M biotype demonstrated to be less efficient for virus transmission in both environments with infection percentage 44% and disease severity less than 56% in the greenhouse environment.

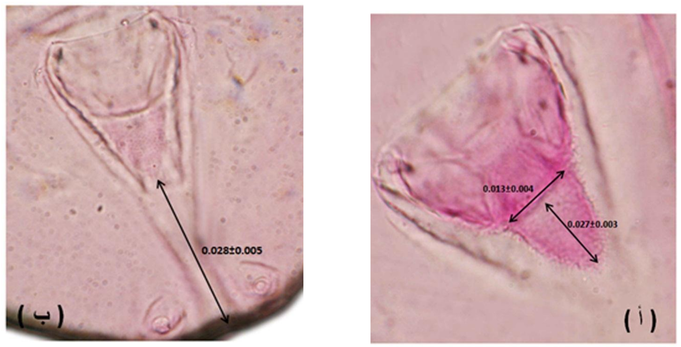
Materials & Methods

- **Four out of 44 insect samples were chosen from different populations, environments and from different heights from the sea surface.**
- **mtCOI technique used to identify the biotypes of *B. tabaci*.**
- **Slide-mounted *B. tabaci* puparia made according to Martin (1987) and Wilkey (1962).**
- **Disease severity has been identified weekly after inoculation depending on the suggested equation by Yang et al., (1996), and according to the scale suggested by Friedmann et al., (1998)**

Results

Length and width of vasiform orifice (M biotype) x80.

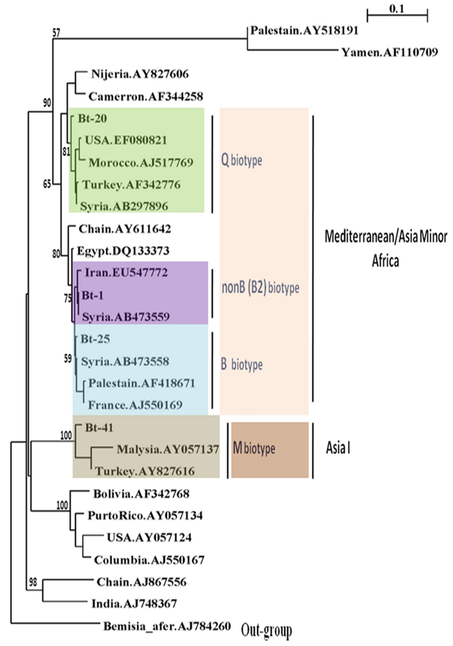
Length and width of lingual (M biotype) & Caudal furrow (B biotype) x80.



Experiment data in both field and greenhouse conditions

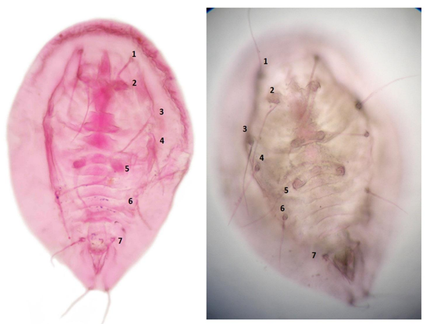
biotype	Field conditions: Number of Infected plants	Infection percentage %	Virus concentration average	Disease severity %	Greenhouse conditions: Number of Infected plants	Infection percentage %	Virus concentration average	Disease severity %
			First Week				First Week	
B	21	84	0.515	48	17	68	0.352	40
nonB	18	72	0.365	44	23	92	0.565	52
Q	14	56	0.288	36	21	84	0.494	42
M	8	32	0.201	32	9	36	0.232	36
			Second Week				Second Week	
B	22	88	1.384	60	18	72	0.813	46
nonB	18	72	1.012	50	23	92	1.228	62
Q	15	60	0.577	42	21	84	1.063	50
M	9	36	0.425	36	11	44	0.501	40
			Third Week				Third Week	
B	22	88	1.919	70	18	72	1.367	56
nonB	18	72	1.625	62	23	92	1.935	74
Q	15	60	1.185	56	21	84	1.627	62
M	10	40	0.718	42	11	44	0.762	46
			Fourth Week				Fourth Week	
B	22	88	2.121	84	18	72	1.571	66
nonB	18	72	1.913	72	23	92	2.204	88
Q	15	60	1.442	60	21	84	1.908	74
M	10	40	0.908	44	11	44	0.929	50
			Fifth Week				Fifth Week	
B	22	88	2.379	92	18	72	1.716	78
nonB	18	72	2.059	80	23	92	2.535	94
Q	15	60	1.614	68	21	84	2.133	84
M	10	40	1.199	48	11	44	1.229	56

Phylogenetic tree according to mtCOI



Length and width of pupa (Q biotype) x10.

Place and distribute of dorsal disc spine (M biotype at right & B biotype at left)



Conclusions

- **M**, **Q**, **nonB** biotypes were first identified and recorded in Syria, in addition to the **B** biotype, which was noted in previous study.
- **Biotypes** can be arranged according to the **morphometric parameters** as M> Q> B = nonB.
- The less efficiency of **M biotype** in transmitting **TYLCV** refers to genetic reasons related to this biotype which spreads in mountainous areas which height range between 400 to 1400 m over sea level, as fields observations showed a decrement of TYLCV infection percentage in mountainous highlands

Reference

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