SUMMARY

A virus isolate was obtained from naturally infected pepper (*Capsicum annuum*, L.) plants showing severe mosaic and grown in different locations in Qalubia Governorate. According to symptomatology, host range, physical properties, mechanical, insect and seed transmission, electron microscopy and serological reactions, the tested virus isolate was identified as pepper strain of *tomato mosaic virus* (ToMV-P).

Mechanically inoculated leaves of pepper plants "California Wonder" cv. showed necrotic local lesions after 4 days, then the inoculated leaves were abscised, followed by systemic symptoms as, vein clearing, leaf deformation, severe mosaic and severe stunting. While sweet and hot peppers "Balady cvs." developed systemic symptoms directly as, vein clearing, mosaic, vein banding and stunting. The symptoms were more apparent on sweet pepper plants than on hot ones. Pepper cv. "Long Red Cayenne" hot pepper, showed light symptoms such as, mild mosaic, yellowing, leaf deformation and little stunting. Sap inoculated pepper plants produced systemic symptoms identical to previously observed on naturally infected pepper plants.

Host range study showed that, most species susceptible to the tested virus isolate belonged to the *Solanaceae* with some others in the families *Amaranthaceae* and *Chenopodiaceae*. The symptoms which appeared on susceptible hosts differed according to the species and cultivars as follows: local lesions followed by no systemic infection were obtained in mechanically inoculated plants of *Chenopodium amaranticolor, C. quinoa, Datura metel, D. stramonium, Nicotiana glutinosa, N. tabacum* cv."Samsun", *N. tabacum* cv. "White Burley" and *N. tabacum* cv. "Xanthi". While local lesions followed by systemic infection were observed on inoculated plants of *Capsicum annuum* cv. "California Wonder" and *Gomphrena globosa*. On

the other hand, hosts reacted with systemic infection only comprise *C. annuum cvs.*("**Balady sweet, Balady hot & Long Red Cayenne**"), *Lycopersicon esculentum* cvs. ("**Beto & UC-97/3**"), *Physalis floridana* and *Solanum nigrum.* On the contrary, hosts showed no symptoms with negative back inoculation tests include all tested species and cultivars of ***Compositae, Cruciferae, Cucurbitaceae, Euphorbiaceae, Graminae, Liliaceae, Malvaceae, Leguminosae, Chenopodiaceae*** except (*Chenopodium amaranticolor* and *C. quinoa*) and only *Solanum tuberosum cvs.* ("**Daimont & Spunta**") of family *Solanaceae.*

Physical properties tests revealed that, this virus isolated had a thermal inactivation point of **88°C**, dilution end point between10^{-5} and 10^{-6} and longevity *in vitro* between **63 - 70** days.

Transmission experiments indicated that, the tested virus isolate was easily transmitted by mechanical inoculation using **0.1 M** phosphate buffer, **pH 7.0** as extraction buffer and Carborundum as an abrasive and the percentage of infection was about **80%** when healthy pepper plants mechanically inoculated with sap obtained from systemically infected pepper plants cv. "**California Wonder**" . *Myzus persicae* was unable to transmit the tested virus isolate after an acquisition period of **2-3 minutes** on infected pepper leaves and feeding period of **24** hours on healthy pepper seedlings. The virus isolate didn't transmitted through seeds of pepper.

Electron microscope preparations clearly showed that, the virus isolate had rigid rod-shaped particles with a length in the range 290-348 nm. with a normal length of 312 nm. The virus particles had a wide of about 14 nm.

Serological study using SDS-agar double diffusion test indicated that, the isolated virus strain was related serologically to the **Tobamovirus** group and not to the **Potyvirus** group. Also, this virus isolate was serologically related to some tested pepper strains of **Tobamoviruses** and not to others.

The pot experiment carried out under glass-house conditions to determine the response of some pepper cultivars to mechanical inoculation with the isolated virus strain showed that, all tested pepper cultivars were susceptible and statistical analysis revealed that, there were highly significant differences between cultivars, so **"California Wonder"** cv.(sweet pepper) showed the highest percentage of infection **(76%)** followed by **"Balady sweet"**cv. **(64%)** then **"Balady hot"** cv. **(34%)**, while **Long Red Cayenne** (hot pepper) cv. exhibited the lowest percentage of infection **(15%)** and hence the sweet pepper cultivars were more susceptible to artificial infection than hot ones.