

# Y

\*

*behboodi@khayam.ut.ac.ir* : - \*  
( // : // : )

Y

Y

( )

Spurr

Y

Y :

.(Valkama 2000)

O C, Z

(*Potato virus Y*) Y

(*Potiviridae*) *Potyvirus*

-

N

-

.(Debokx & Huttinga 1987)

Beemster)

Solanaceae

.(& Deboks 1987

*Solanum* )

(*Nicotiana tabacum*) (*tubersum*

- (*Capsicum spp.*) (*Lycopersicon esculentum*)

.(Valkama 2000)

Y

Carington & Whithom 1998.)

pvyC pvy pvy°

pvyN .(Stratford & Covey 1998

pvyN

( )	
( <i>Chenopodium quinoa</i> )	
/ /	Carington & )
)% 2-mercaptoethanol / pH	(Whithom 1998
<i>Nicotiana</i> )	(
- ( <i>tabaccum</i> cvs White Burley	
DAS-ELISA	.
%	-(Oparka & Roberts 2001)
Clark & Adams)	(DAS-ELISA) P1-HC
	(1977 protease
( ) Bioreba	/
pH 7.4 PBS	(Brigenti <i>et al.</i> 1998)
) ( )	(Inclusion bodies)
	(
	(
	(Rodriguez-Cerezo <i>et al.</i> 1997)
% pH 7.2	
pH 7.2	Y
% /	
	(Hinrichs <i>et al.</i> 1998, Hinrichs <i>et al.</i> 1999)
(% - )	
Spurrs	Y
- Leica	-
	Y
Epstein &)	Formvar DAS-ELISA
%	
	(Holt 1963

Y

(Reynolds 1963)

(Pallisade)

Zeiss III

*Nicotiana tabacum* cv. White Burley

Y

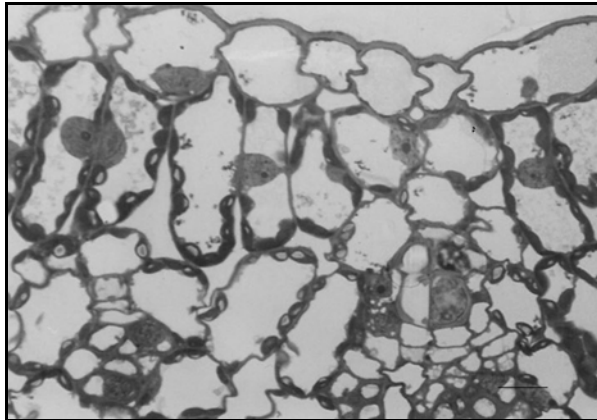
V (Ding *et al.* 1998)

( )

Aerial Space

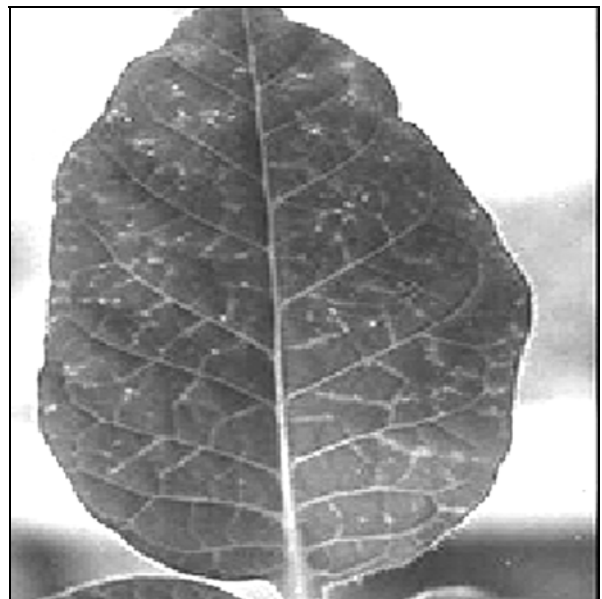
( )

( )



( )

( μm : )



Y

*Nicotiana tabacum* cv. White

Burley

( )

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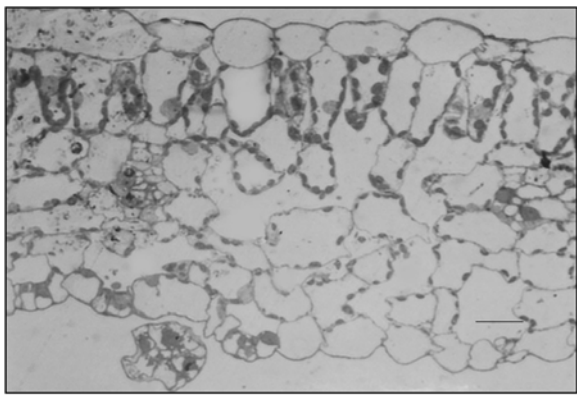
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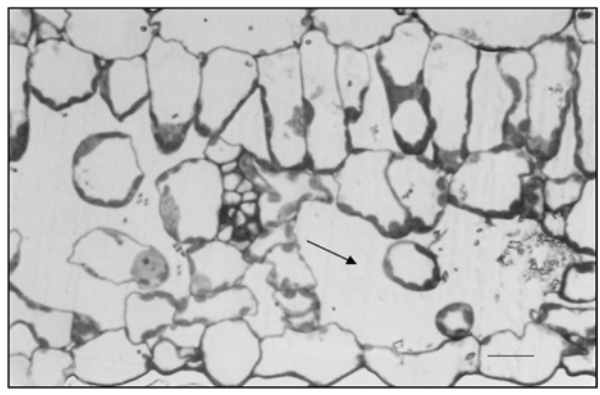
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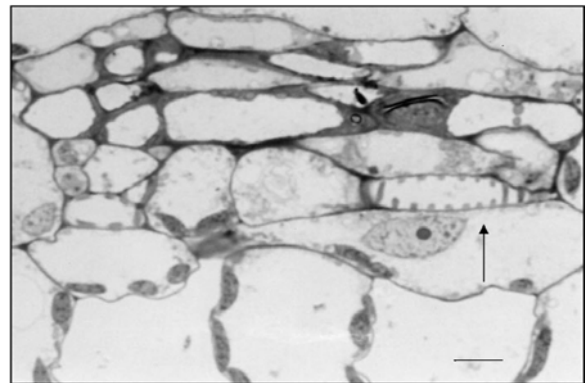
V  
.(  $\mu\text{m}$ : )



Y  
-

: ( )  
:  
.( )  
.( )  
(Plastoglobuli)  
inclusion) .( )  
(bodies

.(  $\mu\text{m}$ : ) (



.(  $\mu\text{m}$ : )

Potyviridae

.(Carington & Whithom 1998)

Y

.(Hinrichs *et al.* 1998)

)

Paramural bodies

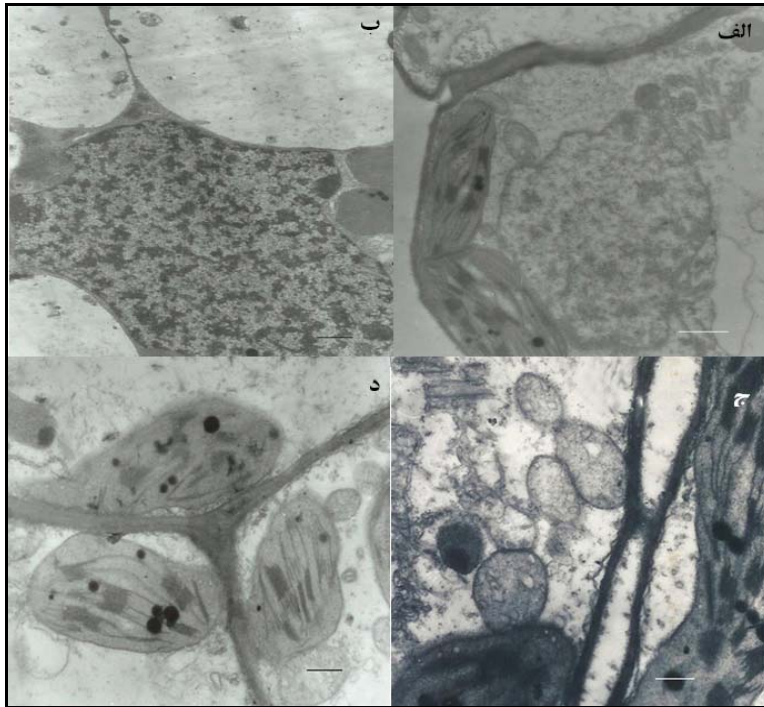
.(

( )

.( )

Hinrichs-)

.(Berger *et al.* 1999, Talarczyk & Hennig 2001



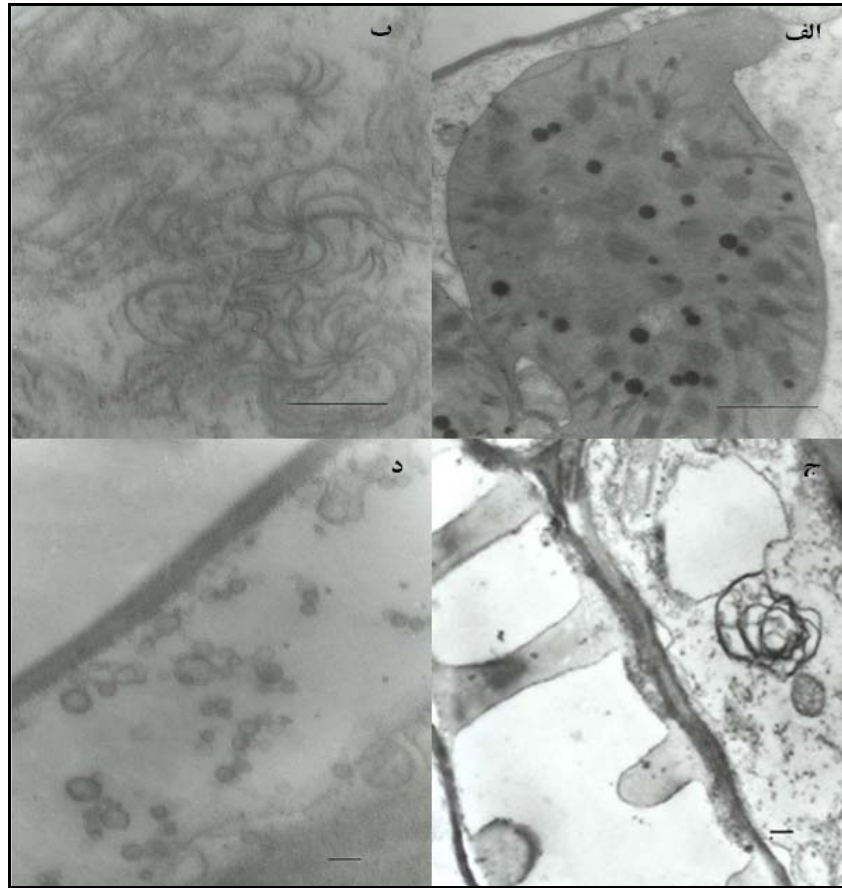
- .( μm: )

: )

- ( μm: )

.( μm: )

- ( μm



- (  $\mu\text{m}$ : ) ( )

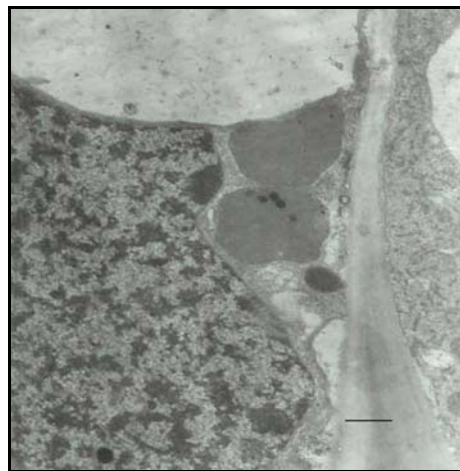
- (  $\mu\text{m}$ : )

**Paramural bodies**

Y

- (  $\mu\text{m}$ : )

(  $\mu\text{m}$ : )



(  $\mu\text{m}$ : )

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	(Shalitin & Wolf 2000)	(PCD)	TMV	(Mittler <i>et al.</i> 1997)	
	(Shtein-Margolina 2002)				Y
Y		(2000)	Seo		
			(HR)		
-		(Seo <i>et al.</i> 2000)	DS9		
	Hinrichs <i>et al.</i> )				
		(1999			
	(Systemic acquired resistance)				
-	Alternative oxidase				
		Y		V	
	(Lam <i>et al.</i> 2001)				X
	(Paramural bodies)	(Ding <i>et al.</i> 1998)			
	(Martelli 1980)			Y	
	Y				
	(Inclusion				
	bodies)			(Mittler 1997, Seo <i>et al.</i> 2000)	
		Y	-		Plastoquinon
	Rodriguez-)				
	(Cerezo <i>et al.</i> 1997, Arbatova <i>et al.</i> 1998				
		Lopez-Carbone <i>et</i> )			Y
		Y		( <i>al.</i> 1998, Zechmann <i>et al.</i> 2003	
	Hinrichs <i>et al.</i> )				
		(1999			

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