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(/ / : / / :)

SrMV SCMV MDMV

TPIA DIBA DAS-ELISA

JGMV

(SCMV)

(pH) /

(PVP)

SCMV

Pennisetum americanum *Panicum miliaceum* *Avena sativa* SCMV

Setaria italica *Hordeum vulgare* *Triticum aestivum*

Minipurification

/ / mg/ml A260/280

SCMV (ISEM)

SDS-

SCMV

Western blotting PAGE

RT-PCR KDa SCMV

bp SCMV R3 SCMV F3

SCMV

(Afsharifar, 1991; Moini & Izadpanah, 2001)

Zea mays L.

(Izadpanah, 1982; Izadpanah, 1985;
Afsharifar, 1991; Izadpanah & Kamran, 1995;
Masumi & Izadpanah, 1995)

(Mirhadi, 2001)

SCMV-MS (Maize SCMV
Shiraz)

SCMV

(Izadpanah, 1985)

Potyvirus

Iranian Johnsongrass Mosaic (IJMV)
(Masumi & Izadpanah, 2001; *Virus*
Masumi *et al.*, 2001)

Potyvirus

MDMV

(*Maize Dwarf Mosaic Virus*: MDMV)

(Moini & Izadpanah, 2001; Zare *et al.*, 2004a;
Zare *et al.*, 2004b)

(*Sugarcane Mosaic Virus*:

(*Sorghum Mosaic* SCMV)
:*JGMV* *Virus*: SrMV)

(*Johnsongrass Mosaic Virus*

۲

Potyvirus †SCMV

(Shukla *et al.*, 1989)

MDMV SCMV

JGMV

SrMV

(Shukla *et al.*, 1989; Chen *et al.*, 2002;)

ZeMV (*Zea Mosaic Virus*)

(Seifers *et al.*, 2000)

-
1. Poaceae
 2. Poaceous potyviruses
 3. SCMV subgroup

(DAS-ELISA)

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°C

)

(

°C

)

Awareness

Statefax-2100

(Technology

$R \geq X+3sd$

:R

:sd

:X)

$\geq 2X$ (

TPIA

(W/V) :

(1998) Dijkstra & deJager (1989) Sambrook *et al.*

(pH) /

(PVP)^r

(W/V)

(

)

PBST

(IgG-AP)

PBST

NBT/BCIP Fast red

(JGMV StMV MDMV SCMV)

TPIA DIBA DAS-ELISA

DIBA

DSMZ

Sambrook

(1998) Dijkstra & de Jager (1998) *et al.*

Clark &

(1976) Adams

-
5. Double Antibody Sandwich - ELISA
 6. ELISA-reader
 7. Tissue Print Immunobinding Assay
 8. Nitrocellulose membrane
 9. Dot Immunobinding Assay

-
1. Freeze-drier
 2. Propagation & maintenance hosts
 3. Polyvinyl pyrrolidon
 4. Enzyme Linked Immuno Sorbent Assay (ELISA)

Glycine (Tris-base) (IgG-AP)
 (SDS /)
 / AP PBST
 Fast red NBT/BCIP
 (SDS-PAGE)
 Sambrook *et al.* (1998)
 °C (PBST)
 PBST Tris-HCl)
 (IgG) (PVP / Boric acid)
 PBST Tris-HCl /)
 (GAR-AP) SDS EDTA
 PBST (/)
 (AP- buffer))
) NBT () BCIP (

RT-PCR

) RT PCR)
 ((/)
 (1997) Yang & Mirkov)
 ()
 ()
 SCMV R3 SCMV F3
 SCMV (EBIA)[†]
 Yang & (CP) Sambrook *et al.*
 (1997) Mirkov (1998) Dijkstra & de Jager (1998)

SCMV F3: 5' TTTCTCACCAAGCTGGAA - 3'
 SCMV R3: 5' AGCTGTGTGTCTCTCTGTATTCTC
 - 3'

SDS-PAGE

3. Goat anti-rabbit
4. Reverse Transcription-Polymerase Chain Reaction

1. Sodium Dodecyl Sulphate – Polyacrylamid Gel Electrophoresis
2. Electroblot Immunoassay or Western Blotting

... :

°C / °C

) °C

(°C

PCR

/	μl	
	μl	10X First Strand Buffer
	μl	mM MgCl ₂
	μl	mM (each) dNTP mix
	μl	pmole /μl Forward primer(SCMV F3)
	μl	pmole /μl Reverse primer(SCMV R3)
	μl	cDNA
/	μl	u/μl Taq polymerase

RT-PCR

/) 0/5X TBE

EDTA / /

(pH

Minipurification

(1986) Jensen *et al.*

/)

/ / / pH

(PVP Na-DIECA

) J-21B Beckman

rpm (

Triton X-100

(V/V)

(/ pH) / (W/V)

rpm

-
2. Final extension
 3. Supernatant

RT-PCR

Corbett) GP001 Palmcycler

(Reaserch

Total RNA

Total RNA

Trireagent (Antibion) RNAWIZ

RNeasy Plant (Sigma)

(QIAGEN) Mini Kit

cDNA

(RT)

RT

RNase-free /

°C

RT °C

°C cDNA

RT

	μl	
	μl	5X First strand buffer
	μl	mM (/ M) DTT
	μl	mM (each) dNTP mix
	μl	total RNA
	μl	pmole /μl Reverse primer (SCMV R3)
/	μl	u/μl RNase inhibitor enzyme
/	μl	u/μl MMLV reverse transcriptase(RT)

/

Taq

RNase Free

°C

Taq

/ °C

1. Polymerase chain reaction

Spinco L50 Beckman
 (/ pH) /
 °C
 (UV)
 Biochrom 4050 LKB
 A260/280
 ×)
 °C (C =A260/EC

°C DSMZ
)
 (
 () °C
 ()
 (pH) /

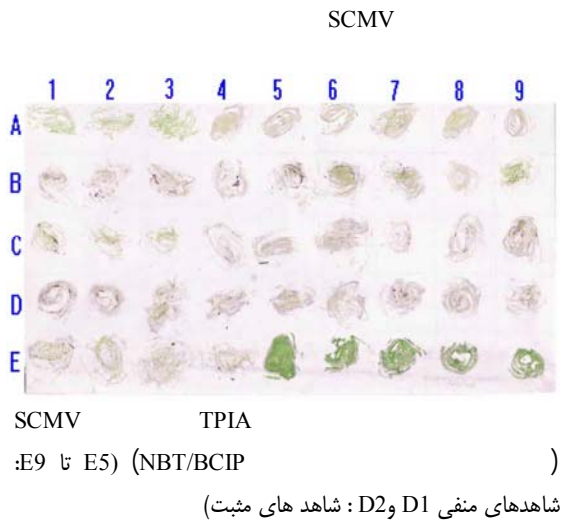
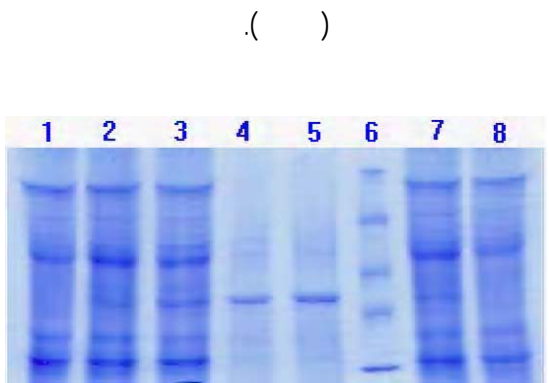
Panicum miliaceum :
Hordeum Avena sativa Pennisetum americanum
Triticum aestivum Setaria italica vulgare

DIBA TPIA ELISA
 (MDMV) (SCMV)
 (SrMV) (JGMV)
 SCMV
 () SCMV

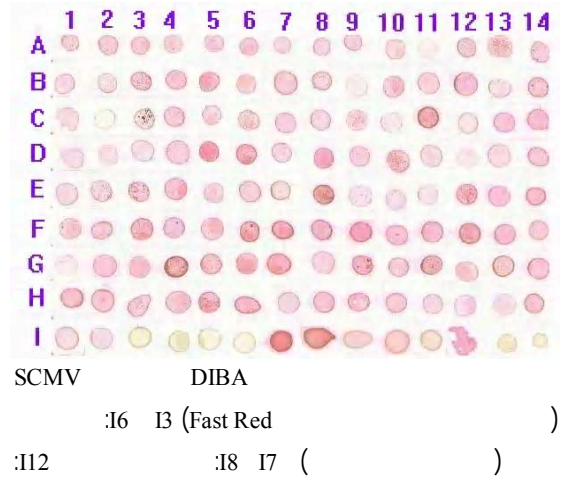
2. Dwarf mosaic
 3. Mottling

1. Stripe

...
 :
 ()
 KDa
 SCMV
 KDa
 SCMV
 SDS-PAGE
 SCMV



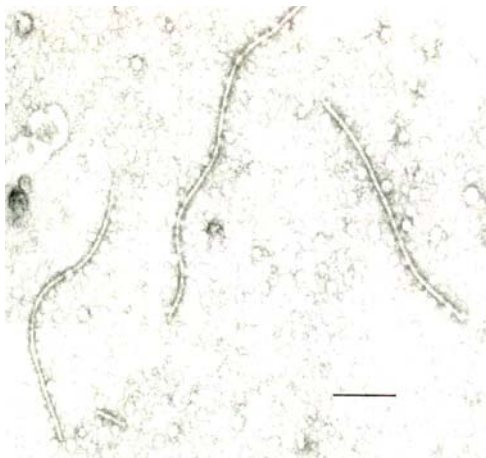
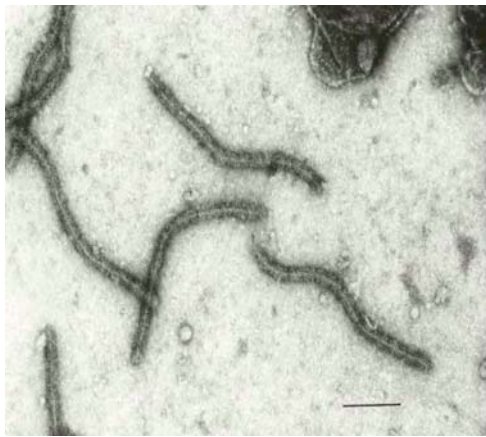
:) SDS-PAGE
 : SCMV :
) : (SCMV
 / : ((Fermentas



:) SCMV
 :
 (:

SCMV
 RT-PCR
 RT-PCR
 SCMV R3 F3
 SCMV
 SDS-PAGE
 KDa

SDS-PAGE
 KDa



DSMZ

SCMV

SCMV

SCMV

Panicum miliaceum

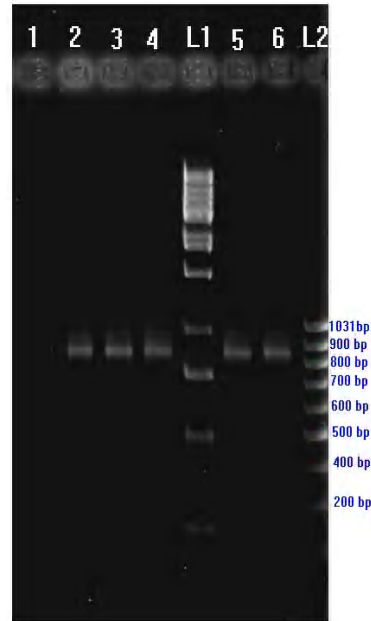
Pennisetum americanum *Setaria italica*

Triticum Sativum *Hordeum Vulgare* *Avena Sativa*

RT-PCR

()

bp



RT-PCR

()

Kb

:L1

bp

Kb

:L2

SCMV

()

SCMV

/

/

/

DMV SCMV

(

) JGMV

SrMV

SCMV

ISEM

()

...

MDMV

MDMV TPIA DAS-ELISA

DIBA

SCMV

SCMV

SCMV JGMV SrMV

()

Izadpanah (Brunt *et al.*, 1997; Dragoljob *et al.*, 1999; Chen *et al.*, 2002)

(1991) Afsharifar (1987) Afsharifar

SCMV Masumi & (2001) Moini & Izadpanah (1991)

SCMV (2001) Izadpanah

SCMV

(Brunt *et al.*, 1997) MDMV SCMV

SCMV ()

MDMV

(Krstic & Tosic, 1995)

(Kuntze *et al.*, 1995; Oertel *et al.*, 1999)

SDS-PAGE SCMV (Chen *et al.*, 2002)

)

(SCMV MDMV

KDa Moini & (2005) Zare *et al.* (2001) Izadpanah

KDa MDMV

SCMV

(Jensen *et al.*, 1986)

(2001) Moini & Izadpanah

KDa MDMV

(2001) Masumi & Izadpanah

() SCMV-MS

() IJMV

/

(Brunt *et al.*, 1997; Dragoljob *et al.*, 1999)

SCMV

SCMV
(SCMV)

SCMV F3
Yang & Mirkov
bp

RT-PCR
SCMV R3
(1997)

(2003) Alegria *et al.*

SCMV F4 SCMV F3

SCMV-MS
(2001) Masumi & Izadpanah

SCMV

ISEM
SCMV

DSMZ

SCMV
Setaria italica *Panicum miliaceum*
Hordeum vulgare *Pennisetum americanum*
Avena sativa *Triticum aestivum*

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