

Contents

	page
Introduction -----	1
Review of the literature -----	3
Materials and methods -----	46
Part (1) Biological and Molecular studies -----	46
I- Detection of banana viruses	
1. External symptoms -----	46
2. Double antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA) -----	46
3. Bioassay methods -----	47
4. Isolation and propagation of banana viruses -----	48
a-Banana bunchy top virus (BBTV)	
Using individual insect vector -----	48
b-Banana mosaic virus (BMV)	
By local lesion assay -----	48
5. Host range	
a- BBTV -----	48
b- BMV -----	49
6. Mode of transmission -----	49
7 Dot immunobinding assay "DIBA" -----	49
8. Histochemical studies -----	50
9. Histopathological studies -----	50
10. Molecular detection of banana viruses	
A- Extraction of total DNA -----	51
B- Extraction of total RNA -----	52
C- PCR amplification of BBTV and RT-PCR	
Amplification of BMV -----	53
D-Gel-electrophoresis analysis -----	54
11. Random amplified polymorphic DNA(RAPD-PCR)--	54
 Part (2) Control of banana virus -----	 57
1. Production of virus-free banana plants	
1. <i>in vitro</i> (tissue culture technique)	
A. Meristem tip culture -----	57
B. chemical treatment -----	59
C. heat treatment -----	60
2. <i>In vivo</i>	
Cormes treatment	
Production of virus – free banana plants	
in nursery conditions . -----	61

II. Eradication of banana viruses in orchards -----	61
Results	
Part (1) Biological and Molecular studies	
I- Detection of banana viruses -----	64
I. A. Symptomology -----	64
a-BBTV	
b. BMV	
B. Serology "DAS-ELISA" -----	67
II- Isolation and propagation of banana viruses	
a- BBTV -----	67
b- BMV	
III- Virus confirmation	
1.Host range -----	68
2. Mode of transmission -----	71
3. Serology "DIBA" -----	71
4. Histochemical studies -----	71
5. Histopathological studies -----	75
6. Molecular detection of banana viruses	
a- PCR of BBTV -----	77
b- RT-PCR amplification of (BMV) -----	77
 Part (2). Eradication of banana viruses (Integrate control)	
I- A. Establishment of an aseptic culture of banana	
<i>in vitro</i> and <i>in vivo</i> -----	80
a. Meristem tip culture -----	83
b. By chemotherapy -----	83
c. By thermotherapy -----	83
i. <i>in vivo</i>	
ii. <i>in vitro</i>	
♦ Detection of vegetative mutation in plantlets -----	87
B. Establishment of virus-free banana plants	
in nursery -----	92
II. Continuation of banana plants growth and control	
the vectors and weeds in open field . -----	92
 Discussion -----	94
Summary -----	103
 References -----	107

Arabic summary