
شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم


# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

**To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%**

# بعض الوثائق الاصلية تالفة

# بالرسالة صفحات لم ترد بالاصل

# PRODUCTION OF VIRUS-FREE PLANTS



By

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B.Sc. (Agric. Microbiology),Ain Shams University (1989)
M.Sc. (Agric. Virology), Ain Shams University (1994)

A thesis submitted in partial fulfillment

of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in
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(Agricultural Viruses)

Department of Agric. Microbiology
Faculty of Agriculture
Ain Shams University

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APPROVAL SHEET

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# ABSTRACT

**Sameh Dif Allah Thabet Attya "Production of Virus-free plants", unpublished Doctor of Philosophy Dissertation, University of Ain Shams, Faculty of Agriculture, Department of Agric. Microbiology, 2000.**

**PART I : Antisera preparation of banana bunchy top virus (BBTV) and banana mosaic virus (BMV).**

Banana bunchy top virus (BBTV) and banana mosaic virus (BMV) were isolated from natural infected banana plants.

BBTV and BMV were partially purified using 10% polyethylene glycol and 1% NaCl and 6% PEG and 2% NaCl respectively and then highly purified using either differential centrifugation, or gel electrophoresis. The virus yield was 0.11 mg/kg infected tissue in case of BBTV, while in case of BMV it was 3.156 mg/kg infected tissue.

Electron microscopy examination showed that BBTV & BMV appeared to be spherical particles with 18-20 nm and 27-29 nm in diameter, respectively.

The induced antisera of highly purified BBTV and BMV using differential centrifugation and gel electrophoresis methods showed positive reaction against BBTV and BMV when examined using agar double diffusion test (Ouchterlony), and double antibody sandwich enzyme linked immunosorbent assay (DAS-ELISA).

**PART II : Factors affecting production of virus-free plants.**

Meristems of infected banana plants with BBTV and BMV were exposed to different treatments : meristem culture, thermotherapy and chemotherapy in order to obtained virus-free banana plantlets.

Data obtained showed that, whenever the infected meristems size was increased, the percentage of resulted virus-free plantlets were decreased.

Exposure the infected banana rhizomes with BBTV or BMV to dry-heat could be produce some virus-free banana plantlets in case of BMV but not in case of BBTV, while exposure the infected rhizomes to 40°C for 1,2 and 3 months followed by meristems excision with different size lead to increasing of the resulted virus-free plantlets.

6-benzyle-aminopurine have no effect on BBTV eradication, while it have a slight effect on the eradication of BMV from banana meristems.

**PART III : Micropropagation of healthy banana plantlets.**

Data of establishment of aseptic culture illustrated that: The growth rate of the cultured meristems was increased in case of excisted meristems from plantlets derived by tissue culture, than from banana suckers, the best treatment of sterilization is to sterilize the shoot tips before meristems excision using hydrogen peroxide 10% for 20 minutes, the best result of preventing the browning was obtained by cultured the explants on liquid medium containing antioxidant.

Data of adaptation stage illustrated that the highest survival percentage of adapted plantlets was obtained using medium consists of sand (25%) + peat moss (12.5%) + clay (12.5%) + fine wood sawdust (50%).

**Key Words:** Banana bunchy top virus; Banana mosaic virus; Isolation; Electron microscope; Purification; Antiserum production; Virus eradication; Meristem size; Thermotherapy;' Chemotherapy; Micropropagation.

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