DETECTION AND IDENTIFICATION OF VIRUSES INFECTING ALLIUMS AND SEVERAL HERBACEOUS ORNAMENTAL PLANTS

THERESIA APRILIA SIANIPAR

DEPARTMENT OF PLANT PROTECTION
FACULTY OF AGRICULTURE
BOGOR AGRICULTURAL UNIVERSITY
BOGOR
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Bogor, August 2024

Theresia Aprilia Sianipar
A3401201053

ABSTRAK

THERESIA APRILIA SIANIPAR. Deteksi Virus Yang Menginfeksi Allium dan Beberapa Tanaman Hias Herba. Dibimbing oleh SARI NURULITA dan DIDIET RAHAYU DIANA.

Kelompok Allium (bawang putih, bawang merah, bawang bombai, bawang daun) dan tanaman hias herba merupakan komoditas hortikultura yang penting secara ekonomi dalam perdagangan internasional. Perdagangan komoditas ini sering kali dilakukan melalui umbi yang memiliki potensi besar terhadap munculnya penyakit baru di suatu negara, termasuk Indonesia. *Potyvirus* dan *Carlavirus* dilaporkan sebagai virus utama yang menginfeksi bawang. Tujuan dari penelitian ini adalah mendeteksi dan mengidentifikasi *Carlavirus* dan *Potyvirus* yang menginfeksi bawang dan tanaman hias herba yang berasal dari sampel lapangan dan umbi impor. Sampel bawang merah,bawang daun, dan tanaman hias herba diambil secara *purposive sampling* di beberapa lokasi. Sampel bawang putih merupakan umbi impor yang diperoleh dari Balai Besar Karantina Hewan, Ikan, dan Tumbuhan DKI Jakarta dan ditumbuhkan di laboratorium. Deteksi virus dilakukan dengan metode *one-step reverse transcription polymerase chain reaction* (RT-PCR) menggunakan primer universal, yaitu AlcarF/Poty1 untuk *Carlavirus* dan U341/Poty1 untuk *Potyvirus*. Hasil deteksi menunjukkan bahwa Carlavirus yaitu *Shallot latent virus* (SLV) ditemukan pada bawang merah, bawang putih, dan bawang daun serta *Nerine latent virus* (NeLV) pada *Hippeastrum* sp dan *Hymenocallis speciosa*. *Onion yellow dwarf virus* (OYDV), *Shallot yellow stripe virus* (SYSV), dan *Amazon lily mosaic virus* (ALiMV) anggota *Potyvirus* yang masing-masing ditemukan pada bawang merah, bawang putih, dan *Hippeastrum* sp. Deteksi NeLV dan ALiMV yang menginfeksi tanaman hias pada studi ini merupakan laporan pertama di Indonesia. Hasil dari penelitian ini dapat menjadi basis data bagi Badan Karantina Indonesia dalam melakukan upaya pencegahan masuk dan tersebarnya Organisme Pengganggu Tumbuhan Karantina.

Kata kunci: ALiMV, *Carlavirus*, NeLV, *Potyvirus*, primer universal, Amaryllidaceae

ABSTRACT

THERESIA APRILIA SIANIPAR. Detection and Identification of Viruses Infecting Alliums and Several Herbaceous Ornamental Plants. Supervised by SARI NURULITA and DIDIET RAHAYU DIANA.

Alliums (garlic, onion, shallot) and herbaceous ornamental plants are economically important horticultural commodities in international trade. The trade of these commodities often through vegetative propagation that has big potential on new emerging diseases in a country, including Indonesia. Potyvirus and carlavirus are reported as the main viruses infecting allium. This research aims to detect and identify *Carlavirus* and *Potyvirus* infecting alliums and herbaceous ornamental plants. Garlic bulb samples were obtained from Indonesian Plant Quarantine Agency (BBKHIT DKI Jakarta) which were then grown in the laboratory. Samples of shallots, leeks, and ornamental plants were taken purposively in several locations. Virus detection was done by one step reverse transcription polymerase chain reaction (RT-PCR) method using universal primers, namely AlcarF/Poty1 for *Carlavirus* and U341/Poty1 for *Potyvirus*. Detection results showed that *Carlavirus* those are *Shallot latent virus* (SLV) was found in shallot, garlic, and leek, and *Nerine latent virus* (NeLV) in *Hippeastrum* sp. and *Hymenocallis speciosa*. *Onion yellow dwarf virus* (OYDV), *Shallot yellow stripe virus* (SYSV) and *Amazon lily mosaic virus* (ALiMV) are members of *Potyvirus* each found in shallot, garlic and *Hippeastrum* sp. The results of this study can be a basis data for Indonesian Plant Quarantine Agency to prevent the new emerging disease. For our knowledge, this is the first report of NeLV and AliMV infecting ornamental plants in Indonesia.

Keywords: ALiMV, Amaryllidaceae, *Carlavirus*, NeLV, *Potyvirus*, universal primer.

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THERESIA APRILIA SIANIPAR

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Examiner of the undergraduate thesis:

1. Dr. Ir. Dadan Hindayana.

Title : Detection and Identification of Viruses Infecting Alliums and Several Herbaceous Ornamental Plants
Name : Theresia Aprilia Sianipar
SIN : A3401201053

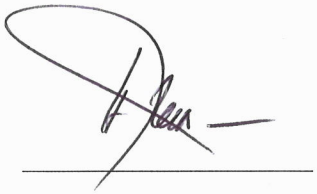
Approved by

Principal Supervisor:
Dr. Sari Nurulita, S.P., M.Si

Co-Supervisor:
Didiet Rahayu Diana, S.P., M.Si

Acknowledged by

Head of Department of Plant Protection:
Dr. Ali Nurmansyah, M.Si
NIP. 196302121990021001



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PREFACE

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Hopefully, this thesis will be useful for those who need it and the advancement of science.

Bogor, August 2024

Theresia Aprilia Sianipar

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