

MAJOR VIRUSES INFECTING WELSH ONION (*Allium fistulosum*) IN WEST JAVA, INDONESIA

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ABSTRACT

FIZEL LAZUAR RUSLIAN. Major Viruses Infecting Welsh Onion (*Allium fistulosum*) in West Java, Indonesia. Supervised by SRI HENDRASTUTI HIDAYAT and SARI NURULITA.

Welsh onion (*Allium fistulosum*) is an important vegetable crop in the highlands of West Java. Information on the viruses infecting this crop remains limited. This study aimed to determine disease incidence, detect target viruses, and identify potential insect vectors at five locations in West Java. Virus detection from symptomatic leaves was conducted by one-step reverse transcription polymerase chain reaction (RT-PCR) using specific primers for onion yellow dwarf virus (OYDV), leek yellow stripe virus (LYSV), shallot yellow stripe virus (SYSV), shallot latent virus (SLV), and garlic common latent virus (GCLV), while universal primers were used for *Orthotospovirus*. Potential vectors were identified using morphological characters and cytochrome c oxidase subunit I (COI) gene analysis. The highest incidence of symptomatic plants occurred in Pamijahan, Bogor (97.83%), and the lowest was found in Pacet, Cianjur (9.67%). SLV was detected most frequently (97.87%), followed by OYDV (34.04%) and SYSV (10.64%). Iris yellow spot virus (IYSV) was confirmed in two of seven samples with necrotic spots, whereas LYSV and GCLV were not detected. *Neotoxoptera formosana* and *Thrips* sp. may serve as vectors based on positive detections of SLV and IYSV, respectively. These findings contributed important knowledge regarding viruses infecting Welsh onion in Indonesia.

Keywords: iris yellow spot virus, *Neotoxoptera formosana*, shallot latent virus, shallot yellow stripe virus, *Thrips* sp.



ABSTRAK

FIZEL LAZUAR RUSLIAN. Virus Utama yang Menginfeksi Bawang Daun (*Allium fistulosum*) di Jawa Barat, Indonesia. Dibimbing oleh SRI HENDRASTUTI HIDAYAT dan SARI NURULITA.

Bawang daun (*Allium fistulosum*) merupakan salah satu komoditas sayuran penting di dataran tinggi Jawa Barat. Informasi mengenai virus yang menginfeksi tanaman ini masih terbatas. Penelitian ini bertujuan menentukan insidensi penyakit, mendeteksi virus sasaran, dan mengidentifikasi serangga vektor potensial di lima lokasi di Jawa Barat. Deteksi virus dari sampel daun bergejala dilakukan menggunakan *one-step reverse transcription polymerase chain reaction* (RT-PCR) dengan primer spesifik untuk *onion yellow dwarf virus* (OYDV), *leek yellow stripe virus* (LYSV), *shallot yellow stripe virus* (SYSV), *shallot latent virus* (SLV), dan *garlic common latent virus* (GCLV), serta primer universal untuk *Orthotospovirus*. Serangga vektor potensial diidentifikasi berdasarkan karakter morfologi dan analisis gen *cytochrome c oxidase subunit I* (COI). Insidensi tanaman bergejala tertinggi ditemukan di Pamijahan, Bogor (97,83%), sedangkan yang terendah ditemukan di Pacet, Cianjur (9,67%). SLV paling sering terdeteksi (97,87%), diikuti oleh OYDV (34,04%) dan SYSV (10,64%). *Iris yellow spot virus* (IYSV) dikonfirmasi pada dua dari tujuh sampel bergejala bercak nekrotik, sedangkan LYSV dan GCLV tidak terdeteksi. *Neotoxoptera formosana* dan *Thrips* sp. berpotensi sebagai vektor berdasarkan terdeteksinya SLV dan IYSV pada masing-masing serangga tersebut. Temuan ini memberikan informasi penting mengenai virus yang menginfeksi bawang daun di Indonesia.

Kata Kunci: *iris yellow spot virus*, *Neotoxoptera formosana*, *shallot latent virus*, *shallot yellow stripe virus*, *Thrips* sp.



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FIZEL LAZUAR RUSLIAN

Undergraduate thesis
In partial fulfillment of the requirements for the degree of
Bachelor of Agriculture at the
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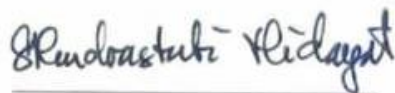
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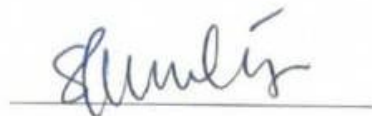
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PREFACE

The author expresses profound gratitude to Allah Almighty for His grace and blessings, which made the completion of this undergraduate thesis possible. This thesis, entitled “Major Viruses Infecting Welsh Onion (*Allium fistulosum*) in West Java, Indonesia,” is based on research conducted from September 2025 to August 2026 in several Welsh onion-growing areas in West Java Province and at the Plant Virology Laboratory and the Insect Biosystematics Laboratory, Department of Plant Protection, Faculty of Agriculture, IPB University. The author gratefully acknowledges the financial support provided by the Australian Centre for International Agricultural Research through the ACIAR SLAM/2018/145 project, coordinated by Prof. Dr. Ir. Sri Hendrastuti Hidayat, M.Sc.

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The author hopes that this thesis will benefit its readers and contribute to the advancement of knowledge, particularly in plant virology and plant protection.

Bogor, August 2026

Fizel Lazuar Ruslian



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