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# Phylogenetic Relationship of *Cymbidium Mosaic Virus* from the Native Orchids of South Kalimantan, Indonesia

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**Abstract.** Information on viral genetics, including their phylogenetic relationship, is valuable in controlling viral infection and screening for the development of virus-resistant cultivars in the future. The objectives of this study were to detect and characterize the *Cymbidium mosaic virus* (CymMV) from the native orchids of South Kalimantan, Indonesia, by the RT-PCR method. Also, to determine their phylogenetic relationship based on a partial genome of RdRp by the ML and PCA methods. Following RT-PCR analysis, one of 10 samples of native orchids used was positively infected by CymMV. In early detection, the RdRp region of CymMV has approximately 530 bp in size. After being sequenced and aligned with other isolates, this region has 121 polymorphic or mutation sites, a GC content of 45.21%, a transition/transversion bias value of 3.52, and nucleotide diversity (0.0415). The phylogenetic analysis revealed that CymMV from South Kalimantan, Indonesia, has closest related to similar isolates from Korea Type 2 (AF016914.1), Niigata, Japan (AB197937.1), Hawaii (EF125180.1), and Taiwan M2 (EU314803.1), with the coefficient divergence of 0.025. But, it has very distantly related to Hawaii 18-1 (EF125178.1) with a coefficient of 0.142. The results provide urgent information in supporting the native orchid's conservation and breeding efforts, locally and globally, including mitigating or controlling the viral infection and screening for the development of virus-free or resistant cultivars in the future.

**Keywords:** Breeding and conservation; mosaic virus; orchids; plant protection; RT-PCR.

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## INTRODUCTION

The native orchids are valuable germplasm for

period until six months (Mursyidin et al., 2021).

However, due to many human impacts, like illegal logging and trading, including natural

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Authors: Dindin Hidayatul Mursyidin, Ahmad Winarto Saputra  
 Title: Phylogenetic Relationship of Cymbidium Mosaic Virus from the Native Orchids of South Kalimantan, Indonesia  
 Original file: 41842-106952-1-SM.DOCX 2023-01-08  
 Supp. files: None  
 Submitter: Dindin Hidayatul Mursyidin  
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 Section: Articles  
 Editor: Priyantini Widiyaningrum  
 Abstract Views: 243

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 Last modified: 2023-08-30

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**Authors**

Name: Dindin Hidayatul Mursyidin  
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 Bio Statement: —  
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 Country: Indonesia  
 Bio Statement: —

**Title and Abstract**

Title: Phylogenetic Relationship of Cymbidium Mosaic Virus from the Native Orchids of South Kalimantan, Indonesia

Abstract: Information on viral genetics, including their phylogenetic relationship, is valuable in controlling viral infection and screening for the development of virus-resistant cultivars in the future. The objectives of this study were to detect and characterize the *Cymbidium mosaic virus* (CymMV) from the native orchids of South Kalimantan, Indonesia, by the RT-PCR method. Also, to determine their phylogenetic relationship based on a partial genome of RdRp by the ML and PCA methods. Following RT-PCR analysis, one of 10 samples of native orchids used was positively infected by CymMV. In early detection, the RdRp region of CymMV has approximately 530 bp in size. After being sequenced and aligned with other isolates, this region has 121 polymorphic or mutation sites, a GC content of 45.21%, a transition/transversion bias value of 3.52, and nucleotide diversity (0.0415). The phylogenetic analysis revealed that CymMV from South Kalimantan, Indonesia, has closest related to similar isolates from Korea Type 2 (AF016914.1), Niigata, Japan (AB197937.1), Hawaii (EF125180.1), and Taiwan M2 (EU314903.1), with the coefficient divergence of 0.025. But, it has very distantly related to Hawaii 19-1 (EF125179.1) with a coefficient of 0.142. The results provide urgent information in supporting the native orchid's conservation and breeding efforts, locally and globally, including mitigating or controlling the viral infection and screening for the development of virus-free or resistant cultivars in the future.

**Indexing**

Keywords: Breeding and conservation; mosaic virus; orchids; plant protection; RT-PCR

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### Phylogenetic Relationship of Cymbidium Mosaic Virus from the Native Orchids of South Kalimantan, Indonesia

Dindin Hidayatul Mursyidin<sup>(1)</sup>, Ahmad Winarto Saputra<sup>(2)</sup>,

DOI: <https://doi.org/10.15294/biosaintifika.v15i2.41842>

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