Abstract

Phytoplasmas, which are bacteria that lack cell walls, are known to infect a variety of host plants and spread quickly within them including fruit plants and other types of flora causing significant agricultural losses. Phytoplasmas infect a wide variety of plants, causing irregular plant growth such as phyllody. Phyllody is a developmental transformation in plants that transforms flowers into leaf-like structures, and the phytoplasmal effector generating phyllody 1 (PHYL1) is a well-known phytoplasmal pathogenic effector. Therefore, the aim of the research is to perform the expression, purification, and crystallization of the PHYL1 protein. The PHYL1 protein was expressed and purified using several techniques, including affinity chromatography, size exclusion chromatography, SDS-PAGE, and x-ray diffraction. The results of the concentration of PHYL1 is 9.697674 mg/mL. The chromatography showed a significant peak, which indicated the presence of PHYL1 in the sample. The result of SDS-PAGE showed a 17kDa instead of 10kDa for PHYL1, the result can be affected by several factors. However, the correct PHYL1 space group was identified using x-ray diffraction, and the data obtained was utilized to determine the structure of PHYL1. On that note, the expression, purification, and crystallization of PHYL1 protein were performed and the structure of PHYL1 protein was found.

Keywords: Phytoplasmal effector causing phyllody 1; protein purification; chromatography; crystallization.