

ABSTRACT

Zayanatul Makiyah. 24020122120037. ***Morphology and Pollen Viability as well as the Receptivity of Stigmas in Frangipani Flowers (Plumeria rubra var. acutifolia Poir.) at Different Flowering Stages.*** Under the guidance of Sri Widodo Agung Suedy & Muhammad Luqman Hakim.

*Frangipani (Plumeria rubra var. acutifolia Poir.) is a hermaphroditic flowering plant with a very low natural fruit formation success rate (<0.1%). This condition is suspected to be related to the mismatch in the maturation timing of male and female gametes. The characterization of pollen morphology is necessary as basic information to understand the development of male gametes related to pollen viability at each flowering phase, while stigma receptivity was performed to determine the readiness of female reproductive organs to receive pollen at each flowering phase. This study aims to analyze the morphology and viability of pollen, as well as the receptivity of the stigma at each flowering phase. The research design used a two-factor Completely Randomized Design, namely the flowering phases (pre-anthesis, anthesis, and post-anthesis) and incubation times (4 and 8 hours), with 10 replications. The purposive sampling method was used for sample collection, considering the flowering phase on the same tree. Pollen morphology analysis was conducted using the acetolysis method and microscopic observation, while pollen viability was tested through in vitro germination using Brewbaker & Kwack medium. Stigma receptivity was tested using a 3% H₂O₂ solution. Data analysis used One-Way ANOVA for polar/equatorial index, Two-Way ANOVA for pollen viability, followed by DMRT test ($\alpha = 0.05$) and Paired T-test. The research results show that the pollen morphology of *P. rubra* is subspheroidal, monad unit, radially symmetrical, heteropolar, tricolpate aperture type with three apertures, and exine ornamentation is scabrate. The P/E index value significantly differed between the pre-anthesis phase (1.02) and the post-anthesis phase (1.07). The highest percentage of pollen viability was during the post-anthesis phase (28.88%) and 8-hour incubation (19.68%). The optimal stigma receptivity during the anthesis phase is marked by the formation of O₂ bubbles on the entire surface of the stigma. The difference in pollen viability and stigma receptivity at each flowering phase indicates the presence of the dichogamy phenomenon. This information can serve as a scientific basis to support artificial pollination, crossbreeding programs, and increased fruit formation in frangipani.*

Keywords: Pollen Morphology, *Plumeria rubra* var. *acutifolia* Poir., Dichogamy, Pollen Germination, Stigma Receptivity