

ABSTRACT

Dian Anggi Puspita. 24020122120003. **Morphological Characteristics and Pollen Viability at Different Flower Developmental Stages of Rice (*Oryza sativa* L.) Variety “Inpari 32”**. Laboratory of Plant Structure and Function, Department of Biology, Faculty of Science and Mathematics, Universitas Diponegoro. Supervised by Sri Widodo Agung Suedy and Yulita Nurchayati.

‘Inpari 32’ rice (*Oryza sativa* L.) is one of Indonesia's superior rice varieties with potential for use in hybridization-based breeding programs. The success of hybridization is influenced by pollen quality, which is reflected in its morphological characteristics and viability. These characteristics are essential for selecting high-quality pollen and are affected by the stage of flower development. This study aimed to analyze the morphological characteristics, viability, and the relationship between pollen morphology and viability at different stages of flower development in ‘Inpari 32’ rice. Flower samples were collected from rice fields in Cepoko Village, Gunungpati District, Semarang City. Sampling was conducted using a purposive sampling method based on three flower developmental stages, namely pre-anthesis, anthesis, and post-anthesis, with ten plants used as replicates for each stage. Pollen morphology was observed using a light microscope equipped with an Optilab camera after acetolysis preparation, while pollen viability was assessed using 0.75% acetocarmine staining. Polar diameter, equatorial diameter, P/E ratio, and pollen viability were analyzed using one-way ANOVA followed by Duncan's Multiple Range Test (DMRT). The relationship between the P/E ratio and pollen viability was analyzed using Pearson's correlation test at a 5% significance level. The results showed that ‘Inpari 32’ rice pollen exhibited consistent morphological characteristics across all flower developmental stages, including monad pollen units, spheroidal shape, radial symmetry, monoporate aperture, isopolar polarity, and psilate exine ornamentation. No significant differences were observed in polar diameter, equatorial diameter, or P/E ratio ($p > 0.05$). In contrast, pollen viability differed significantly among flower developmental stages ($p < 0.001$), with the lowest viability observed at the *pre-anthesis* stage (45.56%), whereas *anthesis* (61.72%) and *post-anthesis* (60.23%) exhibited higher viability without significant differences between them. Pearson's correlation analysis indicated no significant relationship between the P/E ratio and pollen viability ($r = 0.105$; $p = 0.626$). These findings indicate that flower development influences the physiological condition of pollen, as reflected by changes in viability, but does not alter the principal morphological characteristics of ‘Inpari 32’ rice pollen..

Keywords: *Oryza sativa* L., ‘Inpari 32’, pollen morphology, pollen viability.