

INTISARI

Solichatun, Santosa, Kumala Dewi, Rarastoeti Pratiwi. 2016. Dormansi dan Perkecambahan Biji Flamboyan [*Delonix regia* (Hook) Raf.] Ditinjau dari Aspek Anatomis, Fisiologis, dan Biokimiawi. Program Studi Biologi, Program Pascasarjana, Fakultas Biologi, Universitas Gadjah Mada Yogyakarta.

Biji memiliki arti yang sangat penting bagi kehidupan tumbuhan. Dormansi biji didefinisikan sebagai penghambatan perkecambahan biji *viable* pada kondisi lingkungan yang mendukung perkecambahan. Salah satu tumbuhan yang mengalami dormansi biji adalah flamboyan [*Delonix regia* (Hook) Raf.].

Tujuan penelitian ini adalah untuk memahami pengaruh pematangan dormansi secara fisik dan hormonal dalam perkecambahan biji flamboyan; peran bagian biji dalam peristiwa dormansi dan perkecambahan biji; profil hormon endogen; serta aktivitas enzim pemecah endosperm (endo- β -mannanase) pada biji flamboyan. Tahapan penelitian yang dilakukan meliputi analisis peran bagian biji, uji perkecambahan dengan perlakuan fisik dan hormon, *dye tracking*, *blocking experiment*, pengamatan anatomi biji selama proses perkecambahan, kandungan inhibitor pada biji, analisis profil hormon endogen biji, dan analisis aktivitas endo- β -mannanase dengan metode spektrofotometri.

Hasil penelitian menunjukkan bahwa pematangan dormansi secara fisik berupa perendaman biji dalam air panas suhu 98°C selama 5 menit merupakan metode pematangan dormansi biji flamboyan yang paling baik; dan setiap bagian biji yaitu kulit, endosperm, dan embrio berperan penting dalam mengendalikan dormansi dan perkecambahan biji flamboyan. Kulit biji dan endosperm biji flamboyan memiliki struktur yang keras dan *impermeable*, mengandung asam absisat (ABA) serta inhibitor (asam galat dan asam tanat). Embrio juga mengandung ABA dan inhibitor. Berdasarkan *dye tracking* dan *blocking experiment* diketahui bahwa struktur *water gap* biji flamboyan adalah berupa *lens gap*. Biji flamboyan dorman memiliki kandungan ABA yang sangat tinggi baik pada kulit, endosperm maupun embrionya. Saat biji mulai berimbibisi, kandungan ABA turun secara drastis dan akumulasi giberelin (GA₃) meningkat. Aktivitas endo- β -mannanase (MAN) dipengaruhi oleh perlakuan yang diberikan. Perendaman biji flamboyan dalam air panas suhu 98°C selama 5 menit meningkatkan aktivitas MAN, mulai hari ke-3 perkecambahan; sedangkan pemberian GA₃ 100 ppm meningkatkan aktivitas MAN, mulai hari ke-6 perkecambahan.

Kata kunci : *Delonix regia*, biji, dormansi, perkecambahan

ABSTRACT

Solichatun, Santosa, Kumala Dewi, and Rarastoeti Pratiwi. 2016. Anatomical, Physiological, and Biochemical Aspects of Dormancy and Germination of Flamboyant Seed [*Delonix regia* (Hook) Raf.]. Dissertation. Biology Department, Postgraduate Programme of Faculty of Biology, Gadjah Mada University, Yogyakarta.

Seeds are the most typical propagation units of the flowering plants. Seed dormancy is described as the inability of an intact viable seed to complete germination under favorable conditions. Legumes represent the third largest and most diverse family. *Delonix regia* (Hook) Raf. also known as flamboyant is a member of Fabaceae that has seed dormancy.

The aims of this research were to investigate the effect of physical dan hormonal treatment in dormancy breakdown of flamboyant seed; to investigate the role of seed components on the dormancy and germination; to investigate the endogen hormone profile, and to investigate the role of endo- β -mannanase in order to break down the seed dormancy.

The following treatments were applied to break dormancy of *D. regia* seeds: physical treatment and hormonal treatments. Morphological and anatomical changes during dormancy breakdown were investigated using scanning electron microscope. The imbibition pathway tracked using dye tracking and blocking experiment. The endogen hormones profile of the seeds were investigated using HPLC. The endo- β -mannanase (MAN) activity recorded by using spectrophotometry.

The results indicated that physical treatment that seeds dipped in hot water (98°C) for 5 minutes was the most effective treatment to dormancy breakdown of flamboyant seeds. Every seed components (testa, endosperm, and embryo) had an important role during dormancy and germination process. Testa of *D. regia* seeds comprises thick macro sclereids and osteo sclereids, due to impermeability of the seed coat. The testa, endosperm, and embryo also comprise inhibitor substances which are gallic acid and tannic acid that inhibit the germination. The seed endogen hormone profile was dominated by abscisic acid (ABA) in the dormant seed. Using a dye tracking method and blocking experiment, the result showed that the water gap structure of *D. regia* seeds was lens gap type. The dipped seed on hot water treatment increase the activity of MAN, start at 3 days after germination; and the GA₃ 100 ppm treatment also increase the MAN activity start at 6 days after germination.

Keywords : *Delonix regia*, seed, dormancy, germination