

## STUDI VARIASI GENETIK TANAMAN UJI PROVENANS *Gliricidia sepium* (Jacq.) Steud di WANAGAMA I dengan ANALISIS ISOZIM

Oleh :

Yosephin Martha M.A.N.

Mohammad Na'iem<sup>\*\*</sup>

Yeni Widyana N.R.<sup>\*\*\*</sup>

### INTISARI

*Gliricidia sepium* (Jacq.) Steud merupakan salah satu jenis pohon legum yang cepat tumbuh dan mampu mengikat nitrogen. Semakin banyaknya kebutuhan akan kayu bakar dan hijauan ternak, serta manfaat-manfaat lain seperti pupuk hijau, rodentisida, dan bahan pembuatan kertas, mendorong usaha-usaha untuk memperoleh pohon *G. sepium* yang berkualitas. Tingginya permintaan bibit tanaman ini belum disertai dengan ketersediaan sumber benih di Indonesia. Salah satu hal yang mendukung ketersediaan sumber benih bermutu baik adalah pengetahuan tentang informasi genetik yang ada pada pertanaman *G. sepium*. Penelitian ini dilakukan dengan tujuan mengetahui pewarisan pola berkas (*inheritance banding pattern*) *G. sepium* dan mengetahui besarnya variasi genetik dalam dan antar provenans.

Metode yang dipakai adalah elektroforesis vertikal gel *acrilamide* dengan 6 sistem enzim yaitu *6-Phosphogluconate dehydrogenase* (6PG), *Shikimate dehydrogenase* (SHD), *Peroxidase* (POD), *Alcohol dehydrogenase* (ADH), *Diaphorase* (DIA) dan *Esterase* (EST). Bahan penelitian yang digunakan adalah *radicle* tanaman uji *G. sepium* berumur 3 hari dari provenans Guatemala (33 sampel), provenans Nikaragua (35 sampel), provenans Gunungkidul (34 sampel).

Hasil penelitian menunjukkan : (1) Didapatkan 7 lokus polimorfik aktif, yaitu Pod-2, 6Pg-1, Shd-1, Est-1, Est-2, Dia-2, dan Dia-3 yang dikontrol oleh 25 alel. (2) Variasi total yang dimiliki 3 provenans *G. sepium* di Wanagama I cukup tinggi, ditunjukkan oleh persentase lokus polimorfik ( $p_p$ ) 58,333%; rata-rata jumlah alel per lokus ( $A_p$ ) 2,083; heterozigositas total ( $H_T$ ) 0,419; heterozigositas harapan dalam provenans ( $H_s$ ) 0,415; juga nilai heterozigositas observasi ( $H_o$ ) 0,409. Variasi antar provenans ( $D_{ST}$  : 0,004) *G. sepium* di Wanagama I termasuk rendah. (3) Nilai F-is yang bernilai positif (F-is : 0,073), mengindikasikan adanya kecenderungan meningkatnya homozigositas pada 3 provenans *G. sepium* di Wanagama I.

Kata Kunci : provenans, isozim, variasi genetik

Mahasiswa Jurusan Budidaya Hutan, Fakultas Kehutanan, UGM, Yogyakarta

<sup>\*\*</sup> Dosen Pembimbing I, Jurusan Budidaya Hutan, Fakultas Kehutanan, UGM, Yogyakarta

<sup>\*\*\*</sup> Dosen Pembimbing II, Jurusan Budidaya Hutan, Fakultas Kehutanan, UGM, Yogyakarta

GENETIC VARIATION STUDIES OF PROVENANCE TRIAL  
*Gliricidia sepium* (Jacq.) Steud IN WANAGAMA I  
WITH ISOZYME ANALYSIS

By :

Yosephin Martha M.A.N.\*

Mohammad Na'iem\*\*

Yeni Widyana N.R.\*\*\*

ABSTRACT

*Gliricidia sepium* (Jacq.) Steud is one of the fast growing legume species, which has the ability to bind nitrogen. The increasing of firewood and green livestock requirement, and also the other benefit like green manure, rodenticide, and papermaking substance, stimulate efforts to get high quality *G. sepium*. High request of this crop seed has not been accompanied by the availability of seed source in Indonesia. One thing that supports the availability of high quality seed source is knowledge about genetic information in *G. sepium* crop. This research was conducted to know the inheritance banding pattern of *G. sepium* and the genetic variation level within and among provenance.

The method which is used in this analysis is acrilamide gel vertical electrophoresis by 6 enzyme systems; they are *6-Phosphogluconate dehydrogenase* (6PG), *Shikimate dehydrogenase* (SHD), *Peroxidase* (POD), *Alcohol dehydrogenase* (ADH), *Diaphorase* (DIA) and *Esterase* (EST). Three days old of *G. sepium*'s radicle from Guatemala provenance (33 samples), Nicaragua provenance (35 samples), and Gunungkidul provenance (34 samples) were used to isozyme analysis.

The results of this research indicated: (1) There were seven polymorphic loci (Pod-2, 6Pg-1, Shd-1, Est-1, Est-2, Dia-2, and Dia-3). (2) High value of total variation 3 provenance *G. sepium* in Wanagama I, was showed by the polymorphic loci percentage ( $p_p$ ) 58,333 %, the average number of allele per locus ( $A_p$ ) 2,083; total genetic diversity ( $II_T$ ) 0,419; gene diversity within provenance ( $H_s$ ) 0.415; and also observed heterozygosities ( $H_o$ ) 0,409. The gene diversity among provenance of *G. sepium* in Wanagama I ( $D_{ST}$  : 0,004) is relatively low. (3) The positive value of F-index (F-is : 0,073) indicated that an excess of homozygous were discovered in 3 provenance *G. sepium* in Wanagama I.

Key words : provenance, isozyme, genetic variation

The student of Silviculture Department, Faculty of Forestry, GMU, Yogyakarta

\*\* The 1<sup>st</sup> lecturer of Silviculture Department, Faculty of Forestry, GMU, Yogyakarta

\*\*\* The 2<sup>nd</sup> lecturer of Silviculture Department, Faculty of Forestry, GMU, Yogyakarta