

SKRINING AWAL SEMAI KLON *Acacia crassicarpa* TAHAN TERHADAP *Ceratocystis* spp.

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INTISARI

Acacia crassicarpa merupakan salah satu bahan baku industri *pulp* dan kertas di Indonesia yang banyak dikembangkan di lahan gambut. Spesies ini dilaporkan terserang beberapa patogen khususnya jamur *Ceratocystis* spp. Namun demikian, informasi skrining klon *A. crassicarpa* masih terbatas karena dianggap relatif toleran terhadap jamur *Ceratocystis* spp. Tujuan penelitian ini adalah untuk 1) mendeskripsikan karakter morfologi dan pertumbuhan serta mengevaluasi virulensi isolat *Ceratocystis* spp., 2) menskrining klon *A. crassicarpa* yang tahan terhadap *Ceratocystis* spp., 3) mengestimasi parameter genetik sifat tahan klon *A. crassicarpa* terhadap *Ceratocystis* spp., dan 4) mendeskripsikan histologi jaringan batang klon *A. crassicarpa* tahan yang diinokulasi buatan jamur *Ceratocystis* spp.

Uji virulensi pada semai *A. crassicarpa* dilakukan di Laboratorium Perlindungan dan Kesehatan Hutan Fakultas Kehutanan UGM menggunakan 8 isolat *Ceratocystis* spp. (AC1, AC2, AM1, AM2, AM3, AM4, EP1 dan LA1) sebanyak 4 ulangan dengan desain uji Rancangan Acak Lengkap Blok (RALB). Parameter uji virulensi yang diamati adalah panjang lesi luar, panjang lesi dalam, persentase kematian dan waktu kematian semai. Isolat paling virulen digunakan untuk skrining 44 klon *A. crassicarpa* dengan metode inokulasi buatan. Skrining klon dilakukan di persemaian PT Arara Abadi Perawang, Riau dengan desain uji RALB menggunakan 3 unit sampel sebanyak 4 ulangan. Parameter pada uji skrining adalah persentase kematian, Intensitas Gejala pada Daun (IGD), Luas Serangan (LS), Panjang Relatif Lesi Luar (RLL), dan Panjang Relatif Lesi Dalam (RLD) dari klon yang diuji. Parameter genetik sifat tahan diestimasi menggunakan perhitungan *Clonal Mean Heritability* (H_c^2). Persebaran dan intensitas hifa jamur *Ceratocystis* spp. serta adanya lignin di sekitar titik inokulasi pada masing-masing penampang melintang batang klon *A. crassicarpa* yang berstatus respons tahan, toleran, dan moderat diamati secara kualitatif deskriptif.

Hasil uji virulensi menunjukkan isolat AC1 merupakan isolat paling virulen yang menyebabkan panjang lesi luar (30,7 cm), panjang lesi dalam (31,6 cm), dan persentase kematian (75%) dengan waktu kematian tercepat 21 Hari Setelah Inokulasi (HSI). Hasil skrining dari klon yang diuji terkonfirmasi 32 klon berstatus tahan, 8 klon toleran, 3 klon moderat, dan 1 klon rentan. Nilai H_c^2 menunjukkan respons klon *A. crassicarpa* terhadap *Ceratocystis* spp. lebih dipengaruhi oleh faktor genetik dengan nilai H_c^2 berdasarkan variabel IGD (0,70), RLL (0,64), RLD (0,64) dan Persentase Kematian (0,55). Histologi batang klon *A. crassicarpa* berstatus tahan menunjukkan persebaran dan intensitas miselia *Ceratocystis* spp. kurang intensif dibandingkan dengan klon toleran dan klon moderat. Klon tahan membentuk lignin di sekitar titik inokulasi sebagai respons ketahanan terimbas.

KATA KUNCI: *Acacia crassicarpa*, *Ceratocystis* spp., skrining klon, virulen, tahan

INITIAL SCREENING OF *Acacia crassicaarpa* CLONAL SEEDLINGS RESISTANT TO *Ceratocystis* spp.

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ABSTRACT

Acacia crassicaarpa is a raw materials used in Indonesia's pulp and paper industry, which is widely developed on peatlands. *Ceratocystis* spp. has been shown to harm this species. However, because *A. crassicaarpa* is regarded relatively tolerant, information on screening clones remains sparse. this study aimed to: 1) describe the morphological characteristics and growth of *Ceratocystis* spp. as well as evaluate the virulence of the fungi isolates; 2) screen *A. crassicaarpa* clones resistant to *Ceratocystis* spp.; 3) estimate the genetic parameters of *A. crassicaarpa* resistance to *Ceratocystis* spp.; and 4) describe the histology of *A. crassicaarpa* clone stem tissue resistant to *Ceratocystis* spp. through artificial inoculation.

The virulence test on *A. crassicaarpa* seedlings was carried out at the Forest Health and Protection Laboratory, Faculty of Forestry, UGM, using 8 isolates of *Ceratocystis* spp. (AC1, AC2, AM1, AM2, AM3, AM4, EP1, and LA1) with 4 replications with a Randomized Complete Block Design (RALB) test design. The virulence test parameters observed were the length of the outer and the inner lesion, the percentage of death, and the time to death of the seedlings. The most virulent isolate was used to screen 44 clones of *A. crassicaarpa* using the artificial inoculation method. A RALB test design utilizing 3 sample units and 4 replications was used for clone screening at the PT Arara Abadi Perawang nursery in Riau. Parameters in the clones screening test are the percentage of death, Leaf Symptom Intensity (LSI), Disease Incidence (DI), Relative Length of Outer Lesions (RLOL), and Relative Length of Inner Lesions (RLIL). Genetic parameters of resistance traits were estimated using Clonal Mean Heritability (H_c^2) calculations. In each cross-section of the stem with the status of resistant, tolerant, and moderate response, fungal hyphae distribution and intensity, as well as the presence of lignin around the inoculation point, were qualitatively and descriptively examined.

The AC1 isolate was the most virulent isolate, causing outer lesion length (30,7 cm), inner lesion length (31,6 cm), and death percentage (75%), with the shortest death time being 21 Days After Inoculation (DAI). The screening results of the tested clones indicated that 32 were resistant, 8 were tolerant, 3 were moderate, and 1 was susceptible. The H_c^2 number represents the *A. crassicaarpa* clone's response to *Ceratocystis* spp., which is influenced more by genetic factors, with the H_c^2 value based on the variables LSI (0.70), RLOL (0.64), RLIL (0.64), and Percentage of mortality (0.55). The histology of *A. crassicaarpa* resistant stem clones showed that *Ceratocystis* spp. spread less intensively than tolerance and moderate clones. The resistant clones form lignin around the inoculation point as an induced resistance response.

KEYWORDS: *Acacia crassicaarpa*, *Ceratocystis* spp., clone screening, virulent, resitant