

RINGKASAN

Salah satu kendala peningkatan produksi tanaman jagung dan padi yaitu keberadaan gulma. Pengendalian dengan memanfaatkan jamur patogen gulma menjadi pengendalian alternatif yang ramah lingkungan. Jamur patogen gulma menghasilkan metabolit sekunder yang bersifat racun terhadap gulma. Penelitian ini bertujuan untuk mengetahui pengaruh metabolit sekunder jamur patogen gulma (*Fusarium* sp, *Curvularia* sp., dan *Chaetomium* sp.) terhadap gulma daun sempit dan terhadap tanaman budidaya.

Penelitian dilaksanakan di Laboratorium Perlindungan Tanaman dan *Experimental Farm* Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian dilaksanakan mulai September 2020 sampai dengan Februari 2021. Penelitian ini terdiri atas dua tahap yaitu uji metabolit sekunder patogen gulma pada gulma daun sempit dan pada tanaman budidaya. Rancangan yang digunakan adalah rancangan petak terbagi. Petak utama uji metabolit sekunder jamur patogen gulma pada gulma daun sempit dan tanaman budidaya terdiri atas jamur patogen *Fusarium* sp, *Curvularia* sp., dan *Chaetomium* sp. serta anak petak terdiri atas gulma *Imperata cylindrica*, *Cyperus kyllingia*, *Cynodon dactylon*, dan anak petak rancangan uji metabolit sekunder pada tanaman budidaya terdiri atas tanaman jagung dan padi. Variabel yang diamati adalah masa inkubasi, gejala penyakit, intensitas penyakit, laju infeksi, *area under diseases progress curve* (AUDPC), tinggi tanaman, bobot tanaman segar, bobot tanaman kering, dan daya perkecambahan.

Hasil penelitian menunjukkan bahwa metabolit sekunder tiga jamur patogen gulma mampu menginfeksi gulma daun sempit. Pengaruh tunggal patogen menunjukkan bahwa metabolit sekunder jamur *Curvularia* sp. virulen terhadap gulma daun sempit dengan masa inkubasi lebih cepat 79,90%, intensitas penyakit lebih besar 39,91%, laju infeksi lebih besar 0,0144%, dan nilai AUDPC lebih besar 99,69% dibanding kontrol. Metabolit sekunder tiga jamur patogen gulma menurunkan tinggi tanaman 26,66%, bobot tanaman segar 65,03%, dan bobot tanaman kering 47,23% dibanding kontrol. Pengaruh tunggal gulma menunjukkan bahwa gulma yang paling rentan yaitu *Cynodon dactylon* yang ditunjukkan dengan intensitas penyakit sebesar 28,08%. Berdasarkan pengaruh kombinasi perlakuan metabolit sekunder terhadap gulma daun sempit menunjukkan bahwa perlakuan *Fusarium* sp. pada *Cynodon dactylon* dan perlakuan *Curvularia* sp. pada *Cyperus kyllingia* menunjukkan intensitas penyakit tertinggi masing-masing yaitu 53,08% dan 48,14%. Perkecambahan biji *Cynodon dactylon* terendah oleh jamur *Fusarium* sp. sebesar 77,80% dan *Chaetomium* sp. pada biji *Cyperus kyllingia* sebesar 87,51%. Metabolit sekunder tiga jamur patogen gulma tidak virulen terhadap tanaman padi dan jagung.

SUMMARY

One of the obstacles to increase maize and rice production is the presence of weeds. Control of the weeds by utilizing weed pathogenic fungi is an environmentally friendly alternative control. Weed pathogenic fungi produce secondary metabolites that are toxic to weeds. This study aimed to determine the effect of secondary metabolites of weed pathogenic fungi (Fusarium sp, Curvularia sp., and Chaetomium sp.) on narrow leaf weeds and on cultivated plants.

The research was conducted at the Laboratory of Plant Protection and the experimental farm, Faculty of Agriculture, Jenderal Soedirman University from September 2020 to February 2021. This study consisted of two stages, namely testing of secondary metabolites of weed pathogens on narrow leaf weeds and on cultivated plants. The design used was a split plot design. The main plot consisted of the pathogenic fungi Fusarium sp, Curvularia sp., and Chaetomium sp. and subplots consisted of Imperata cylindrica, Cyperus kyllingia, Cynodon dactylon, maize, and rice. The variables observed were the incubation period, disease symptoms, disease intensity, infection rate, disease area under progress curve (AUDPC), plant height, fresh plant weight, dry plant weight, and germination ability of weeds seeds.

The results showed that the secondary metabolites of three weed pathogenic fungi were able to infect narrow leaf weeds. From the single effect of the pathogen, the secondary metabolites of Curvularia sp. were virulent against narrow leaf weeds with 79.90% faster incubation period, 39.91% higher disease intensity, 0.0144% higher infection rate, and 99.69% greater AUDPC value than control. The secondary metabolites decreased plant height by 26.66%, fresh plant weight to 65.03%, and dry plant weight to 47.23% compared to control. From the single effect of weeds, the most susceptible weed was Cynodon dactylon indicated by a disease intensity of 28.08%. From the combination effect, Fusarium sp. on Cynodon dactylon and treatment of Curvularia sp. on Cyperus kyllingia showed the highest disease intensity respectively as 53.08 and 48.14%. The lowest seed germination of Cynodon dactylon was performed by Fusarium sp. of 77.80% and Chaetomium sp. on seeds Cyperus kyllingia amounted to 87.51%. The secondary metabolites of three weed pathogenic fungi were not virulent to rice and maize.