

RINGKASAN

Produksi cabai merah keriting (*Capsicum annum* L.) masih tergolong rendah akibat serangan hama dan penyakit, salah satunya adalah penyakit antraknosa yang disebabkan oleh fungi *Colletotrichum* spp. Penyakit ini dapat menurunkan hasil panen hingga lebih dari 50%. Pengendalian dengan menggunakan fungisida sintetis memiliki kelemahan seperti risiko kesehatan, resistensi patogen, dan biaya tinggi. Oleh karena itu, penggunaan fungi rizosfer sebagai agensia hayati menjadi alternatif yang efektif, ekonomis, dan ramah lingkungan. Penelitian ini bertujuan untuk mengetahui potensi dari beberapa isolat fungi rizosfer sebagai agensia biokontrol terhadap penyebab penyakit antraknosa yang diuji *in vitro*, mengetahui pengaruh isolat fungi rizosfer terhadap penghambatan penyakit antraknosa yang diuji *in plantae*, mengetahui isolat fungi rizosfer yang paling efektif dalam menekan penyakit antraknosa pada tanaman cabai.

Penelitian dilakukan dalam dua tahapan. Tahap pertama dilakukan untuk memperoleh isolat fungi yang berpotensi melalui uji *dual culture*, kemudian dipilih beberapa isolat fungi yang memiliki daya hambat tertinggi. Variabel bebas yaitu isolat fungi rizosfer yang berbeda. Variabel terikat yaitu daya penghambatan pertumbuhan patogen. Parameter yaitu diameter koloni patogen pada cawan Petri kontrol dan pada cawan Petri perlakuan. Tahap kedua, isolat terpilih selanjutnya diuji antagonismenya dengan metode *in plantae* menggunakan Rancangan Acak Lengkap (RAL) dengan tiga ulangan. Variabel bebas berupa isolat fungi rizosfer hasil skrining, variabel terikat berupa intensitas serangan. Parameter utama yaitu jumlah bercak daun yang disebabkan oleh penyakit antraknosa, parameter pendukung yang diukur berupa periode inkubasi, tinggi tanaman, jumlah daun, dan rata-rata luas daun.

Hasil penelitian tahap pertama yaitu uji antagonisme fungi antagonis terhadap fungi patogen *Colletotrichum* sp. efektif menghambat pertumbuhan patogen *Colletotrichum* sp. secara *in vitro* dengan persentase penghambatan lebih dari 60%. Persentase tertinggi terdapat pada perlakuan I5A2 (*Trichoderma* sp.5) yaitu sebesar 76,39%. Hasil uji penelitian tahap kedua menunjukkan fungi antagonis mampu menekan intensitas serangan penyakit antraknosa pada tanaman cabai. Isolat rizosfer paling efektif menekan penyakit antraknosa pada cabai adalah I5A1 (*Trichoderma* sp.4) dengan persentase penghambatan hingga 95,93%.

Kata kunci: *antraknosa, biokontrol, Capsicum annum, Colletotrichum* sp., *fungi rizosfer*

SUMMARY

The production of curly red chili peppers (*Capsicum annum* L.) is still relatively low due to pest and disease attacks, one of which is anthracnose caused by the fungus *Colletotrichum* spp. This disease can reduce crop yields by more than 50%. Control using synthetic fungicides has drawbacks such as health risks, pathogen resistance, and high costs. Therefore, the use of rhizosphere fungi as biological agents is an effective, economical, and environmentally friendly alternative. This study aims to determine the potential of several rhizosphere fungal isolates as biocontrol agents against anthracnose pathogens tested in vitro, to assess the effect of rhizosphere fungal isolates on inhibiting anthracnose disease tested in plantae, and to identify the most effective rhizosphere fungal isolates in suppressing anthracnose disease in chili plants.

The research was conducted in two stages. The first stage involved obtaining potential fungal isolates through dual culture testing, followed by selecting several isolates with the highest inhibitory activity. The independent variable was different rhizosphere fungal isolates. The dependent variable was the inhibitory activity against pathogen growth. The parameters were the diameter of pathogen colonies on control Petri dishes and on treated Petri dishes. In the second stage, the selected isolates were further tested for their antagonism using the in plantae method with a Completely Randomized Design (CRD) and three replications. The independent variable was the rhizosphere fungal isolates obtained from screening, and the dependent variable was the intensity of infection. The main parameter was the number of leaf spots caused by anthracnose disease, and the supporting parameters measured were the incubation period, plant height, number of leaves, and average leaf area.

The results of the first stage of research, namely the antagonism test of antagonistic fungi against the pathogenic fungus *Colletotrichum* sp., effectively inhibited the growth of the pathogen *Colletotrichum* sp. in vitro with an inhibition percentage of more than 60%. The highest percentage was found in treatment I5A2 (*Trichoderma* sp.5), which was 76.39%. The results of the second phase of the study showed that antagonistic fungi were able to suppress the intensity of anthracnose disease attacks on chili plants. The most effective rhizosphere isolate in suppressing anthracnose disease in chili plants is I5A1 (*Trichoderma* sp.4), with an inhibition percentage of up to 95.93%.

Keywords: *anthracnose, biocontrol, Capsicum annum, Colletotrichum sp., rhizosphere fungi*