

## RINGKASAN

Salah satu tanaman hortikultura yang dibudidayakan dan mempunyai arti ekonomis bagi petani adalah tanaman kentang (*Solanum tuberosum*) namun produksinya masih rendah oleh serangan organisme pengganggu tanaman (OPT) khususnya patogen *Fusarium oxysporum* penyebab penyakit layu fusarium pada tanaman kentang. Pengendalian penyakit tanaman dengan pestisida sintetis berpotensi menyebabkan banyak masalah yang merugikan diantaranya menimbulkan residu pada hasil tanaman yang akan mengganggu kesehatan konsumen, pencemaran lingkungan serta membunuh organisme lainnya yang bukan sasaran. Upaya untuk mengurangi penggunaan pestisida sintesis salah satunya dengan cara pemanfaatan asap cair. Efektivitas asap cair dalam menekan patogen dan intensitas penyakit layu fusarium pada kentang dipengaruhi oleh jenis dan konsentrasi asap cair yang digunakan. Penelitian ini bertujuan untuk mengetahui pengaruh asap cair terhadap pertumbuhan jamur *Fusarium* sp., mengetahui efektivitas asap cair dalam menekan intensitas penyakit layu fusarium pada tanaman kentang dan mengetahui kombinasi jenis dan konsentrasi asap cair yang optimal dalam menekan intensitas penyakit layu fusarium pada tanaman kentang.

Penelitian dilakukan di Laboratorium Mikologi dan Fitopatologi serta Green House Fakultas Biologi Universitas Jenderal Soedirman dengan metode eksperimental menggunakan Rancangan Acak Lengkap (RAL) dengan 10 perlakuan dan 3 ulangan. Variabel bebas berupa kombinasi jenis dan konsentrasi asap cair serta variabel terikat berupa penekanan pertumbuhan *Fusarium* sp. dan intensitas penyakit layu fusarium tanaman kentang. Parameter utama berupa diameter koloni jamur *Fusarium* sp. dari perlakuan *in vitro* dan persentase kerusakan akibat penyakit busuk daun tanaman kentang dari perlakuan *in plantae* dan parameter pendukung berupa kadar asam total, kadar fenol total, tinggi tanaman dan jumlah daun serta suhu dan kelembaban udara harian. Pengambilan sampel tanah dilakukan menggunakan teknik *purposive sampling*. Data yang diperoleh dari hasil penelitian uji *in vitro* dianalisis secara deskriptif dan pada uji *in plantae* data dianalisis menggunakan ANOVA dengan tingkat kepercayaan 95%, kemudian dilanjutkan dengan uji Beda Nyata Jujur (BNJ) apabila perbandingan perlakuan signifikan.

Hasil uji *in vitro* menunjukkan bahwa setiap perlakuan kombinasi masing-masing jenis dan konsentrasi asap cair memberikan respons yang berbeda terhadap pertumbuhan *Fusarium* sp.. Perlakuan asap cair dari sekam menghasilkan indeks antijamur tertinggi sebesar 68% pada konsentrasi 3%, sedangkan perlakuan asap cair tempurung kelapa dan kayu jati menghasilkan indeks antijamur tertinggi sebesar 100% pada konsentrasi 2% dan 3%. Sementara itu, pada uji *in plantae* menunjukkan bahwa asap cair tempurung kelapa 2% memiliki pengaruh terbaik dalam menghambat pertumbuhan jamur *Fusarium* sp. penyebab penyakit layu fusarium pada tanaman kentang. Perlakuan asap cair sekam 3% dan kayu jati 2% juga masih mampu menghambat pertumbuhan jamur *Fusarium* sp. penyebab penyakit layu fusarium pada tanaman kentang, namun efektivitasnya tidak sebaik asap cair tempurung kelapa 2%.

Kata kunci: asap cair, *Fusarium* sp. layu fusarium, kentang

## SUMMARY

One of the cultivated horticultural crops that has economic significance for farmers is the potato plant (*Solanum tuberosum*), but its production is still low due to attacks by plant pests (OPT), especially the pathogen *Fusarium oxysporum*, which causes fusarium wilt disease in potato plants. Controlling plant diseases with synthetic pesticides has the potential to cause many detrimental problems, including leaving residues in crop yields that will harm consumer health, polluting the environment, and killing other non-target organisms. One effort to reduce the use of synthetic pesticides is by utilizing liquid smoke. The effectiveness of liquid smoke in suppressing pathogens and the intensity of fusarium wilt disease in potatoes is influenced by the type and concentration of liquid smoke used. This study aims to determine the effect of liquid smoke on the growth of *Fusarium* sp. fungi, determine the effectiveness of liquid smoke in suppressing the intensity of fusarium wilt disease in potato plants, and determine the optimal combination of types and concentrations of liquid smoke in suppressing the intensity of fusarium wilt disease in potato plants.

This research was conducted in the Mycology and Phytopathology Laboratory and Green House of the Faculty of Biology, Jenderal Soedirman University with an experimental method using a Completely Randomized Design (CRD) with 10 treatments and 3 replications. The independent variables were combinations of types and concentrations of liquid smoke and the dependent variables were suppression of *Fusarium* sp. growth and intensity of fusarium wilt disease in potato plants. The main parameters were the diameter of *Fusarium* sp. fungal colonies from in vitro treatment and the percentage of damage due to leaf blight disease in potato plants from in plantae treatment and supporting parameters were total acid content, total phenol content, plant height and number of leaves as well as daily air temperature and humidity. Soil sampling was carried out using a purposive sampling technique. Data obtained from the results of the in vitro test were analyzed descriptively and in the in plantae test the data were analyzed using ANOVA with a 95% confidence level, then continued with the Honestly Significant Difference (HSD) test if the treatment comparison was significant.

Test results in vitro show that each combination of liquid smoke types and concentrations responded differently to the growth of *Fusarium* sp.. Liquid smoke treatment from rice husks produced the highest antifungal index of 68% at a concentration of 3%, while liquid smoke treatment from coconut shells and teak wood produced the highest antifungal index of 100% at concentrations of 2% and 3%. Meanwhile, in plantae tests showed that 2% coconut shell liquid smoke had the best effect in inhibiting the growth of *Fusarium* sp., the fungus that causes Fusarium wilt in potato plants. The 3% rice husk liquid smoke and 2% teak wood liquid smoke treatment was also able to inhibit the growth of *Fusarium* sp., the fungus that causes Fusarium wilt in potato plants, but its effectiveness was not as good as the 2% coconut shell liquid smoke.

Keywords: *Fusarium* sp. fusarium wilt, liquid smoke, potato