

RINGKASAN

Manggis (*Garcinia mangostana* L.) merupakan salah satu buah yang digemari oleh masyarakat Indonesia. Permasalahan utama dalam sistem produksi manggis adalah masih rendahnya mutu yang dihasilkan, karena masih terdapatnya penyakit tanaman. Sampai saat ini petani manggis masih menggunakan fungisida sintesis yang berdampak buruk bagi kesehatan maupun lingkungan untuk mengendalikan patogen *Pestalotia* sp. Berdasarkan hal tersebut, maka perlu dicari alternatif pengendalian patogen penyebab penyakit yang ramah lingkungan, yaitu pengendalian menggunakan metabolit sekunder agensia hayati. Penelitian ini bertujuan untuk: 1) Mengkaji keefektifan aplikasi metabolit sekunder dari isolat *Pseudomonas fluorescens* P60, *P. fluorescens* P20, dan *P. fluorescens* P8 dalam menekan penyakit bercak daun *Pestalotia* sp. pada bibit manggis; 2) Mengetahui pengaruh metabolit sekunder dari isolat *P. fluorescens* P60, *P. fluorescens* P20, dan *P. fluorescens* P8 terhadap pertumbuhan bibit manggis.

Penelitian dilaksanakan dari bulan Mei 2017 sampai dengan November 2017 dan berlokasi di *Screen house* dan Laboratorium Perlindungan Tanaman, Fakultas Pertanian Universitas Jenderal Soedirman. Penelitian *in vitro* menggunakan Rancangan Acak Kelompok yaitu dengan 4 perlakuan dan 6 ulangan. Perlakuannya terdiri atas kontrol, metabolit sekunder *P. fluorescens* P60, *P. fluorescens* P20, dan *P. fluorescens* P8. Penelitian *in planta* menggunakan Rancangan Acak Kelompok yaitu dengan 5 perlakuan dan 5 ulangan. Perlakuan terdiri atas kontrol, fungisida (berbahan aktif benomil), metabolit sekunder *P. fluorescens* P60, *P. fluorescens* P20, dan *P. fluorescens* P8. Variabel yang diamati yaitu daya hambat *in vitro*, intensitas penyakit, luas bercak, tinggi tanaman, jumlah daun, dan analisis jaringan, kualitatif.

Hasil penelitian menunjukkan bahwa metabolit sekunder *P. fluorescens* P60 dan *P. fluorescens* P8 mampu menghambat pertumbuhan *Pestalotia* sp. *in vitro* masing-masing sebesar 25% dan 22,3% dibandingkan dengan perlakuan lain. Secara *in planta* aplikasi metabolit sekunder *P. fluorescens* P60 mampu menekan intensitas penyakit bercak daun sebesar 26,09% serta meningkatkan kandungan senyawa fenol (saponin dan glikosida). Aplikasi metabolit sekunder *P. fluorescens* P20 dan P8 mampu menekan intensitas penyakit sebesar 6,52% dan 21,74%. Aplikasi metabolit sekunder *P. fluorescens* tidak mampu meningkatkan tinggi tanaman bibit manggis. Aplikasi metabolit sekunder *P. fluorescens* P60 dan *P. fluorescens* P8 mampu meningkatkan jumlah daun bibit manggis masing-masing sebesar 26,87% dan 23,08%.

SUMMARY

Mangosteen (Garcinia mangostana L.) is one of Indonesian popular fruits. The main problems in the mangosteen production system is low quality of product, due to diseases. Leaf spot disease is one of main diseases on mangosteen seedlings. The disease caused by Pestalotia sp. Mangosteen farmers still apply synthetic fungicides for controlling diseases which cause negative impact not only for health but for environmental as well. An environmental friendly disease control alternative is needed. Secondary metabolites derived from biological agents is one of the alternative. This research aims to: 1) study the effectiveness of secondary metabolite application derived from of Pseudomonas fluorescens P60, P. fluorescens P20, and P. fluorescens P8 in suppressing the disease on mangosteen seedlings; 2) know the effect of the secondary metabolites on mangosteen seedling growth.

The research was carried out from May to November 2017 at the Screenhouse and the Laboratory of Plant Protection, Faculty of Agriculture, Jenderal Sudirman University. Randomized complete block design was used in in vitro research with six replications and four treatments. The treatments consisted of control, secondary metabolite of P. fluorescens P60, P. fluorescens P20, and P. fluorescens P8. Randomized complete block design was used in in planta one, with five replications and five treatments. The treatments consisted of control, fungicide (active ingredient of benomil), secondary metabolite of P. fluorescens P60, P. fluorescens P20, and P. fluorescens P8. Observed variables were inhibition of Pestalotia sp. growth in vitro, disease intensity, spot area, plant height, numbers of leaf, and fenol contents of leaf tissue.

Results indicated that the secondary metabolites of P. fluorescens P60 and P. fluorescens P8 inhibited growth of Pestalotia sp. in vitro by 25% and 22.3%, respectively, compared to control and other treatment. Secondary metabolite application of P. fluorescens P60 and P. fluorescens P8 suppressed the disease intensity by 26.09% and 27.74%, respectively, and increase phenolic compounds (saponins and glycosides) content qualitatively. Secondary metabolite of P. fluorescens P60, P. fluorescens P20, and P. fluorescens P8 did not increase seedling height. Secondary metabolite of P. fluorescens P60 and P. fluorescens P8 increased the number of leaf by 26.87% and 23.08%, respectively.