

RINGKASAN

Meniran (*Phyllanthus niruri* L.) termasuk famili Euphorbiaceae yang mempunyai metabolit sekunder seperti fenol, flavonoid, tanin, dan lignan utama berupa filantin yang berperan dalam mengurangi risiko penyakit degeneratif. Peningkatan metabolit sekunder pada meniran dapat dilakukan dengan induksi cekaman kekeringan, namun jika terus-menerus tercekam pertumbuhan dan metabolit sekunder tanaman dapat menurun atau tidak optimal karena dampak negatifnya. Pemanfaatan jamur yang berperan sebagai stimulator dalam pertumbuhan atau *plant growth promoting fungi* (PGPF) dan pertahanan tanaman mampu meningkatkan tanaman inang untuk toleran terhadap kadar air yang rendah (cekaman). Penelitian ini bertujuan untuk mengetahui pengaruh interaksi ko-kultivasi jamur pemacu tumbuh dan waktu cekaman kekeringan terhadap kandungan metabolit sekunder meniran, serta untuk menentukan aplikasi jamur pemacu tumbuh dan waktu cekaman kekeringan yang menghasilkan metabolit sekunder optimal pada meniran.

Metode penelitian dilakukan menggunakan metode eksperimental yang disusun secara Rancangan Acak Kelompok (RAK) Faktorial dengan 2 faktor. Faktor pertama adalah metode aplikasi jamur, terdiri atas (J0, J1, J2, J3, J4) yang diaplikasikan secara inokulasi tanah/IT. Faktor kedua adalah waktu cekaman, terdiri atas 0 hari, 2 hari, dan 4 hari. Semua perlakuan diulang 3 kali. Variabel bebas meliputi metode aplikasi beberapa jamur dan waktu cekaman kekeringan. Variabel terikat terdiri atas karakter fisiologis dan kandungan metabolit sekunder meniran. Parameter yang diamati yaitu pengukuran kadar fenol total dan kadar flavonoid total. Parameter pendukung meliputi pertumbuhan tanaman (tinggi tanaman, jumlah daun majemuk, jumlah anak daun), panjang tajuk, panjang akar, bobot basah total dan kering, nilai klorofil total, *relative water content* (RWC), dan kandungan filantin. Hasil penelitian yang diperoleh dianalisis menggunakan analisis ragam (ANOVA) dengan tingkat kesalahan 5% dan dilanjutkan dengan Uji DMRT (*Duncan's Multiple Range Test*).

Hasil penelitian menunjukkan bahwa interaksi perlakuan ko-kultivasi jamur dan cekaman kekeringan tidak memberikan pengaruh yang nyata terhadap metabolit sekunder yang dihasilkan meniran, namun perlakuan cekaman kekeringan 2 hari memiliki kecenderungan dalam meningkatkan metabolit sekunder meniran yang dihasilkan, sedangkan pemberian perlakuan jamur J4 (*Penicillium* sp.) ada kecenderungan dalam meningkatkan produksi metabolit sekunder yaitu kandungan fenol total dan flavonoid total yang dihasilkan.

Kata kunci: *antioksidan, ko-kultivasi, cekaman kekeringan, filantin, jamur pemacu pertumbuhan, meniran*

SUMMARY

Meniran (*Phyllanthus niruri* L.) belongs to the familia Euphorbiaceae which has secondary metabolites such as phenols, flavonoids, tannins, and the main lignan in the form of filantin which plays a role in reducing the risk of degenerative diseases. Increasing secondary metabolites in meniran can be done by inducing drought stress, but if continuously stressed, plant growth and secondary metabolites can decrease or not be optimal due to the negative impact. Utilization of fungi that act as stimulators in growth or *plant growth promoting fungi* (PGPF) and plant defense so as to increase the host plant to tolerate low water content (stress). This study aims to determine the effect of interaction the co-cultivation of growth-promoting fungi and drought stress time on the content of secondary metabolites of meniran, and to determine the application of growth-promoting fungi and drought stress time that produces optimal secondary metabolites in meniran.

The research method was conducted using an experimental method arranged in a Factorial Randomized Group Design (RAK) with 2 factors. The first factor was the method of fungal application, consisting of (J0, J1, J2, J3, J4) which was applied in soil inoculation/IT. The second factor is the time of stress, consisting of 0 days, 2 days, and 4 days. All treatments were repeated 3 times. The independent variables include the application method of some fungi and drought stress time. Independent variables include the application method of several fungi and drought stress time. The dependent variable consists of physiological characters and secondary metabolite content of meniran. Parameters observed were measurement of total phenol content and total flavanoid content. Supporting parameters include plant growth (plant height, number of compound leaves, number of leaflets), crown length, root length, total and dry wet weight, total chlorophyll value, relative water content (RWC), and phyllanthin content. The results obtained were analyzed using analysis of variance (ANOVA) with an error rate of 5% and continued with DMRT (Duncan's Multiple Range Test).

The results showed that the interaction of fungal co-cultivation treatment and drought stress did not give a significant effect on the secondary metabolites produced by meniran, but the 2-day drought stress treatment had a tendency to increase the secondary metabolites of meniran produced, while the provision of fungal treatment J4 (*Penicillium* sp.) had a tendency to increase the production of secondary metabolites, namely the total phenol content and total flavonoids produced.

Keywords: *antioxidant, co-cultivation, drought stress, phyllanthin, growth-promoting fungi, meniran*