

Intisari

Kekeringan diketahui sebagai faktor pembatas untuk pertumbuhan tanaman tomat yang dapat memengaruhi pertumbuhan dan perkembangan. Pada beberapa penelitian sebelumnya, rhizobakteri osmotoleran (*Enterobacter flavescens* strain Al-19) dapat mendukung pertumbuhan tanaman pada kondisi kekurangan air. Pada penelitian ini, *E. flavescens* strain Al-19 digunakan sebagai inokulum pada penanaman tomat di berbagai periode kekurangan air. *E. flavescens* strain Al-19 ditumbuhkan di medium LB cair dan digunakan sebagai inokulum benih tomat dengan merendamnya pada kultur cair *E. flavescens* strain Al-19. Benih yang telah diinokulasi ditanam pada *polybag* berisi tanah tidak steril dan pupuk organik. Kadar lengas tanah dipertahankan pada 70% kapasitas lapangan selama penanaman. Perlakuan kondisi kekurangan air dilakukan dengan tidak menyiram tanaman pada berbagai fase pertumbuhan, yaitu: (1) awal masa tanam sampai 15 hari setelah tanam (HST); (2) 15 HST sampai 30 HST; (3) 30 HST sampai 45 HST; dan (4) 45 HST sampai 60 HST. Parameter pertumbuhan yang diamati adalah (1) tinggi tanaman, (2) panjang akar, (3) berat tajuk, (4) berat akar, (5) jumlah dan berat tomat, dan (5) dinamika pertumbuhan mikrobia. Hasil dari penelitian ini menunjukkan bahwa penggunaan *E. flavescens* strain Al-19 sebagai inokulum dapat mendukung pertumbuhan tanaman dibuktikan pada parameter pertumbuhan yang menunjukkan perbedaan signifikan dibandingkan dengan tomat tanpa inokulasi *E. flavescens* strain Al-19. Secara umum *E. flavescens* strain Al-19 berpotensi mendukung pertumbuhan dan produksi tomat pada kondisi kekurangan air di berbagai fase pertumbuhan.

Kata kunci: tomat, kekurangan air, *Enterobacter flavescens* strain Al-19, rhizobakteri osmotoleran.

Abstract

Drought is widely known as a limiting factor for plant growth, including tomato, which may affect its growth and productivity. In several previous studies, osmotolerant rhizobacteria (*Enterobacter flavescens* strain AI-19) has been demonstrated to support plant growth under limited water availability. In this study, *E. flavescens* strain AI-19 has been used as an inoculant for tomato cultivation under different periods of water limitation or drought periods. *E. flavescens* strain AI-19 was cultured in broth LB medium and used to inoculate tomato seeds by dipping the seeds in the *E. flavescens* strain AI-19 liquid culture. The inoculated seeds were then planted into the non-sterile soil-filled polybags, supplemented with organic manure. The water capacity of the soil was kept at 70% of field capacity throughout cultivation. Water limitation treatments were designed by omitting watering at different periods of plant growth, i.e.: (1) early planting until 15 days after seed planting (ASP); (2) 15 days ASP until 30 days ASP; (3) 30 days ASP until 45 days ASP; and (4) 45 days ASP until 60 days ASP. Plant growth parameters observed were: (1) plant height, (2) root length, (3) plant weight, (4) root weight, (5) number and weight of tomato, and (5) microbial growth dynamics. The results of the study demonstrated that the use of *E. flavescens* strain AI-19 as inoculant supported plant growth as evidenced by several growth parameters which showed significant differences compared to the uninoculated tomato. In general, it was observed that *E. flavescens* strain AI-19 demonstrated its potential as an inoculant for tomato growth and production under water limitation at several growth periods.

Keywords: tomato, water limitation, *Enterobacter flavescens* strain AI-19, osmotolerant rhizobacteria.