

RINGKASAN

Tanah pasir besi memiliki kandungan bahan organik rendah dengan kandungan besi (Fe) berkisar 38-59%, yang ditemukan di beberapa daerah pesisir pantai. Tanaman cabai (*Capsicum annuum* L.) memiliki toleransi tinggi terhadap lingkungan. Pemberian isolat *Plant Growth Promoting Rhizobacteria* (PGPR) dapat membantu pertumbuhan tanaman cabai pada lahan marginal karena membantu dalam penyerapan hara dan nutrisi yang dibutuhkan. Penelitian ini bertujuan untuk menguji potensi isolat bakteri PT4C5, KT6A5, dan CT4A7 sebagai PGPR, mengetahui kemampuan isolat bakteri PT4C5, KT6A5, dan CT4A7 dalam perkecambahan tanaman cabai, mengetahui kemampuan isolat bakteri PT4C5, KT6A5, dan CT4A7 dalam meningkatkan pertumbuhan tanaman cabai dengan metode *axenic sand culture assay* serta mengetahui identitas isolat bakteri PT4C5, KT6A5, dan CT4A7 berdasarkan karakter fenotipik.

Penelitian dilakukan secara survei dan eksperimental. Penelitian secara deskriptif dilakukan untuk mengetahui karakteristik fenetik isolat bakteri asal rizosfer tanaman yang tumbuh di lingkungan pasir besi, sedangkan penelitian secara eksperimental dilakukan untuk mengetahui potensi isolat bakteri asal rizosfer tanaman yang tumbuh di lingkungan pasir besi dalam meningkatkan perkecambahan dan pertumbuhan vegetatif tanaman cabai. Penelitian dilakukan menggunakan Rancangan Acak Lengkap (RAL) dengan 5 macam perlakuan yaitu kontrol menggunakan akuades steril, dan empat perlakuan inokulasi isolat PT4C5, KT6A5, CT4A7, konsorsium, dan EM4. Masing-masing perlakuan diulang 3 kali.

Hasil penelitian menunjukkan bahwa isolat PT4C5, KT6A5, dan CT4A7 asal rizosfer tanaman yang tumbuh di lingkungan pasir besi memiliki karakter sebagai PGPR karena mampu menambat nitrogen, melarutkan fosfat dan kalium, memproduksi hormon tumbuh IAA, dan memproduksi siderofor. Isolat PT4C5, KT6A5, dan CT4A7 berpengaruh terhadap persentase perkecambahan biji cabai terutama konsorsium. Inokulasi isolat PT4C5, KT6A5, dan CT4A7 berpengaruh terhadap tinggi tanaman, bobot basah tanaman, panjang akar, jumlah daun, dan kandungan klorofil daun. Berdasarkan karakterisasi fenotipik, isolat PT4C5, KT6A5, dan CT4A7 diduga kelompok genus *Planococcus*.

Kata Kunci: *Axenic sand culture assay*, *Capsicum annuum* L., PGPR

SUMMARY

Iron sand soil has low organic matter content with iron (Fe) content ranging from 38-59%, which is found in some coastal areas. Chili plants (*Capsicum annuum* L.) have a high tolerance to the environment. Giving *Plant Growth Promoting Rhizobacteria* (PGPR) isolates can help the growth of chili plants on marginal land because it helps in the absorption of nutrients and nutrients needed. This study aims to test the potential of bacterial isolates PT4C5, KT6A5, and CT4A7 as PGPR, determine the ability of bacterial isolates PT4C5, KT6A5, and CT4A7 in the germination of chili plants, determine the ability of bacterial isolates PT4C5, KT6A5, and CT4A7 in increasing the growth of chili plants with axenic sand culture assay method and determine the identity of bacterial isolates PT4C5, KT6A5, and CT4A7 based on phenotypic characters.

The research was conducted survey and experimentally. Descriptive research was conducted to determine the phenetic characteristics of bacterial isolates from the rhizosphere of plants growing in the iron sand environment, while experimental research was conducted to determine the potential of bacterial isolates from the rhizosphere of plants growing in the iron sand environment in increasing germination and vegetative growth of chili plants. The research was conducted using a completely randomized design (CRD) with 5 treatments, namely control using sterile distilled water, and four inoculation treatments of PT4C5, KT6A5, CT4A7, consortium, and EM4. Each treatment akarepeated 3 times.

The results showed that isolates PT4C5, KT6A5, and CT4A7 from the rhizosphere of plants growing in an iron sand environment have characteristics as PGPR because they are able to fix nitrogen, dissolve phosphate and potassium, produce growth hormone IAA, and produce siderophores. Isolates PT4C5, KT6A5, and CT4A7 affect the percentage of chili seed germination, especially the consortium. Inoculation of PT4C5, KT6A5, and CT4A7 isolates affects plant height, plant wet weight, root length, number of leaves, and leaf chlorophyll content. Based on phenotypic characterization, isolates PT4C5, KT6A5, and CT4A7 were identified belongs to genus *Planococcus*.

Keywords: *Axenic sand culture assay, Capsicum annuum* L., PGPR