INTISARI

Silikon (Si) dilaporkan dapat menurunkan kejadian penyakit jamur di berbagai patosistem. Namun, keberadaan Si dalam tanah berbentuk silikon dioksida (SiO_2) tidak dapat diserap langsung oleh akar tanaman. Tanaman menyerap Si dalam bentuk asam monosilikat (H_4SiO_4). Bakteri pelarut silika (BPS) dapat berperan dalam melarutkan Si agar tersedia bagi tanaman. Selain meningkatkan ketersediaan Si bagi tanaman, BPS dapat berperan secara langsung dalam melawan jamur melalui beberapa cara diantaranya dengan memproduksi enzim hidrolitik, siderofor, HCN dan antibiotik. Tujuan dari penelitian ini adalah untuk mendapatkan isolat BPS yang berasal dari tanah grumusol dan regosol rizosfer bawang merah dan mengetahui potensi antagonisnya terhadap *Fusarium acutatum* penyebab penyakit moler. Pengujian BPS meliputi uji indeks kelarutan Si, uji reaksi hipersensitif, uji pigmen fluoresen pada media King's B, uji gram KOH 3%, uji antagonis *in vitro* terhadap *F. acutatum*, aktivitas enzim protease, produksi siderofor, dan identifikasi molekuler dengan sekuensing 16s-rRNA. Hasil isolasi diperoleh 5 isolat BPS dengan pertumbuhan dan pelarutan Si yang baik di media agar Magnesium trisilika. Kelima isolat BPS menunjukkan aktivitas antagonis terhadap *F. acutatum s*ecara *in vitro*. Tiga isolat terbaik yaitu BC1-12, BP2-30, dan BC4-3 memiliki daya hambat *F. acutatum* berturut-turut sebesar 38,73%, 34,78%, dan 33,89%. Ketiga isolat tersebut teridentifikasi memiliki similaritas dengan *Pseudomonas putida*. Sedangkan daya hambat terendah yaitu 14,29% dihasilkan oleh strain yang teridentifikasi memiliki similaritas dengan *Neobacillus drentensis*. Empat isolat *P. putida* mampu menghasilkan siderofor dan protease yang diduga terlibat dalam mekanisme antagonis terhadap *F. acutatum* secara *in vitro*. Hasil penelitian menunjukkan bahwa *P. putida* merupakan strain yang mendominasi tanah gromosol dan regosol rizosfer bawang merah. Penelitian lebih lanjut diperlukan untuk mengetahui pengaruh aplikasi BPS dalam meningkatkan ketersediaan Si bagi tanaman dan meningkatkan ketahanan terhadap penyakit moler di lapangan.

Kata kunci: Bakteri pelarut silika (BPS), *Fusarium acutatum*, aktivitas antagonis, *Pseudomonas putida*

ABSTRACT

Silicon (Si) is reported to reduce the incidence of fungal diseases in various pathosystems. However, the presence of Si in the soil in the form of silicon dioxide (SiO_2) cannot be absorbed directly by plant roots. Plants absorb Si in the form of monosilicic acid (H_4SiO_4). Silicate solubilizing bacteria (SSB) plays an important role in soil by the solubilizing insoluble form of silicate. In addition to increasing the availability of Si for plants, SSB plays a direct role against fungi in several ways, including by producing hydrolytic enzymes, siderophores, HCN, and antibiotics. This study aimed to obtain isolates of SSB from grumusol and regosol soil of shallot rhizosphere and to determine the potential antagonist against *Fusarium acutatum,* the causal agents of shallot twisted disease. SSB observation including Si solubilizing index, hypersensitivity reaction test, fluorescent pigment on King's B media, 3% KOH gram test, in vitro antagonist test against *F. acutatum,* protease enzyme activity, siderophore production, and molecular identification by 16s-rRNA sequencing. The results of sample isolation obtained 5 SSB isolates with good growth and dissolution of Si on Magnesium trisilicate agar. All five SSB isolates showed antagonistic activity against *F. acutatum*. The three best isolates are BC1-12, BP2-30, and BC4-3 had *F. acutatum* inhibition of 38.73%, 34.78%, and 33.89%, respectively. The three isolates were identified as having similarities with *Pseudomonas putida*. Meanwhile, the lowest inhibition of 14.29% is produced by the strain identified as having similarity with *Neobacillus drentensis*. Four isolates of *P. putida* are capable of producing siderophores and proteases that are thought to be involved in antagonistic mechanisms against *F. acutatum* in vitro. The results showed that *P. putida* was the dominant strain in the gromosol and regosol soil of shallots rhizosphere. Further research is needed to determine the effect of SSB applications in increasing the availability of Si for plants and increasing resistance to shallot twisted in the field

Keywords: Silicate solubilizing bacteria (SSB), *Fusarium acutatum*, antagonistic activity, *Pseudomonas putida*