



## Kajian Viabilitas dan Stabilitas Bakteri Perombak Paraquat di Tanah Gambut, Vertisol dan Karier

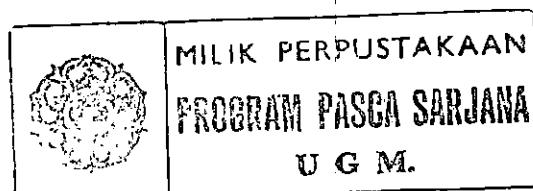
### Intisari

Paraquat adalah senyawa organik sintetik, merupakan bahan aktif herbisida bertoksitas kuat, sangat persisten dalam tanah dan bersifat non-selektif. Paraquat berpotensi menyebabkan pencemaran lingkungan. Inokulasi bakteri SM1 dan S2 masing-masing ke dalam tanah telah diketahui mampu mempercepat proses perombakan paraquat. Namun sampai sekarang belum diketahui viabilitas dan stabilitas kedua bakteri tersebut di tanah gambut, vertisol dan karier yang tercemar paraquat. Penelitian ini bertujuan untuk mengetahui viabilitas dan stabilitas bakteri SM1 dan S2 di gambut, vertisol dan karier yang tercemar 20 ppm paraquat, mengetahui pengaruh inokulasi kultur campuran bakteri SM1 dan S2 terhadap perombakan paraquat dan mengidentifikasi isolat tersebut berdasarkan data sekuens gen 16 S rRNA.

Pada penelitian ini dilakukan empat tahap kegiatan yaitu: (1) Penandaan antibiotika bakteri SM1 dan S2, (2) Uji viabilitas dan stabilitas bakteri SM1 dan S2 di gambut (fibrik, saprik), vertisol dan karier (3) perombakan paraquat di tanah gambut, vertisol dan karier. (4) identifikasi bakteri SM1 dan S2 berdasarkan data sekuens gen 16 S rRNA.

Hasil penelitian menunjukkan bahwa bakteri SM1 dan S2 memiliki viabilitas paling baik di gambut fibrik diikuti karier, saprik dan vertisol. Bakteri SM1 stabil di gambut fibrik dan karier, tidak stabil di saprik dan vertisol. Bakteri S2 tidak stabil di gambut fibrik, saprik, vertisol dan karier. Inokulasi kultur campuran bakteri SM1 dan S2 di gambut fibrik, saprik, vertisol dan karier dapat meningkatkan perombakan paraquat masing-masing sebesar 58,46%, saprik 9,69%, vertisol 27,27% dan karier 14,29%. Bakteri SM1 diklasifikasikan ke dalam genus *Brevibacterium* dan bakteri S2 dalam *Micrococcus*.

Kata kunci: viabilitas, stabilitas, bakteri tanah, tanah gambut





## STUDY ON THE VIABILITY AND STABILITY PARAQUAT DEGRADING BACTERIA IN THE PEAT SOIL, VERTISOL AND CARRIER

### Abstract

Paraquat is an organic synthetic compound that has been used as active compound of herbicides. Because of its persistency and toxicity, paraquat caused environmental pollution. Previous experiment showed that inoculation of the *SM1* and *S2* bacteria was proficient to accelerate paraquat degrading in soil. However, the viability and stability of *SM1* and *S2* in peat soil, vertisol and carrier have not been studied yet. The objectives of this research were to study the viability and stability of *SM1* and *S2* in peat soil, vertisol and carrier, and also to identify of *SM1* and *S2* based on the alignment of their 16S rRNA gene sequence.

The research was carried out in four stages, there are (1) selection antibiotics marker for *SM1* and *S2* isolates, (2) viability and stability experiment of *SM1* and *S2* in peat soil (fibric and sapric), vertisol and carrier, (3) paraquat degrading analysis in peat soil, vertisol and carrier (4) identification of *SM1* and *S2* based on the alignment of their 16S rRNA gene sequence.

The results showed that the viability of mix cultures of *SM1* and *S2* isolates in fibric was highest compared to those in carrier, sapric and vertisol. *SM1* was more stable in fibric and carrier than in sapric and vertisol, however *S2* was not stable in fibric, sapric, vertisol and carrier. Inoculation of the mix cultures of *SM1* and *S2* in fibric, sapric, vertisol and carrier increased the amount of degraded paraquat in those media i.e. 58,46%, 9,69%, 27,27%, and 14,29% respectively. Based on the alignment of 16S rRNA gene sequence, *SM1* isolat was clasification on the *Brevibacterium* and *S2* isolat on the *Micrococcus*.

**Keywords:** viability, stability, soil bacteria, peat soil