

ISOLASI DAN KARAKTERISASI PGPR (*PLANT GROWTH PROMOTING RHIZOBACTERIA*) PENAMBAT NITROGEN DARI TANAMAN GULMA SEMBUNG RAMBAT (*Mikania micrantha* Kunth)

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INTISARI

Mikania micrantha Kunth merupakan gulma invasif yang menyebabkan kerusakan ekologis dan penurunan produktivitas pertanian, yang keberhasilan tumbuhnya didukung oleh bakteri penambat nitrogen di rhizosfer. Penelitian ini bertujuan mengisolasi, mengkarakterisasi, dan menganalisis dinamika pertumbuhan bakteri penambat nitrogen yang berpotensi sebagai PGPR (*Plant Growth Promoting Rhizobacteria*) untuk pengembangan *biofertilizer* ramah lingkungan. Lima isolat berhasil diperoleh melalui penumbuhan pada medium Burk's dan menunjukkan hasil positif pada medium NFB berindikator *bromothymol blue*, ditandai dengan pembentukan *pellicle* dan perubahan warna medium menjadi biru. Karakterisasi morfologi koloni, morfologi sel, serta uji biokimia dan fisiologis menunjukkan variasi fenotip antar isolat yang memungkinkan identifikasi awal pada tingkat genus. MCN1 dan MCN2 memiliki kedekatan fenotipik dengan *Paraburkholderia* dan *Burkholderia*, sedangkan MCN3 dan MCN5 konsisten dengan *Enterobacter* sebagai diazotrof fakultatif. MCN4 menunjukkan pertumbuhan lambat pada medium Burk's dan karakter mikroaerofilik yang mengarah pada *Kosakonia*. Analisis pertumbuhan dilakukan berdasarkan nilai *optical density* pada medium Burk's dan *Nutrient Broth* menggunakan model Baranyi. MCN3 menunjukkan pertumbuhan terbaik pada medium Burk's, sedangkan MCN5 lebih unggul pada *Nutrient Broth*. Hasil ini menunjukkan bahwa bakteri rhizosfer *M. micrantha* berpotensi dikembangkan sebagai *biofertilizer* berbasis PGPR.

KATA KUNCI: Baranyi, Burk's, nitrogen, PGPR

ISOLATION AND CHARACTERIZATION OF PGPR (PLANT GROWTH PROMOTING RHIZOBACTERIA) NITROGEN FIXATION FROM THE INVASIVE PLANTS SEMBUNG RAMBAT (*Mikania micrantha* Kunth)

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Abstract

Mikania micrantha Kunth is an invasive weed that causes ecological damage and reduces agricultural productivity, and its invasion success may be supported by nitrogen-fixing bacteria in the rhizosphere. This study aimed to isolate, characterize, and analyze the growth dynamics of nitrogen-fixing bacteria with potential as plant growth-promoting rhizobacteria (PGPR) for environmentally friendly biofertilizer development. Five isolates were obtained through cultivation on Burk's medium and showed positive nitrogen-fixation activity on nitrogen-free bromothymol blue (NFB) medium, indicated by pellicle formation and a color change of the medium to blue. Phenotypic characterization based on colony morphology, cell morphology, and biochemical and physiological tests revealed variability among isolates, allowing preliminary genus-level identification. Isolates MCN1 and MCN2 showed phenotypic affinity to Paraburkholderia and Burkholderia, respectively, while MCN3 and MCN5 were consistent with Enterobacter as facultative diazotrophs. Isolate MCN4 exhibited slow growth on Burk's medium and microaerophilic characteristics suggestive of Kosakonia. Growth dynamics were evaluated based on optical density measurements in Burk's medium and Nutrient Broth using the Baranyi growth model. MCN3 showed the most efficient growth in Burk's medium, whereas MCN5 performed better in Nutrient Broth. These findings indicate that rhizosphere bacteria associated with *M. micrantha* have potential for development as PGPR-based biofertilizers.

KEYWORDS: Baranyi, Burk's, nitrogen, PGPR