

Phylogeny of Indonesian nostoc (cyanobacteria) isolated from paddy fields as inferred from partial sequence of 16S rRNA gene = Filogeni nostoc asal tanah persawahan Indonesia berdasarkan sekuen parsial gen 16S rRNA

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Abstrak

Untuk memperoleh koleksi kekayaan hayati Nostoc Indonesia dilakukan isolasi mikroflora tanah dari beberapa lahan persawahan di wilayah di Jawa, Bali, dan Sulawesi Selatan. Isolat-isolat yang tumbuh cepat diidentifikasi secara morfologi dan molekuler menggunakan sekuen parsial dari gen 16S rRNA. Walaupun hubungan kekerabatan antar isolat belum sepenuhnya dapat dijelaskan, pohon filogeni yang dihasilkan dari analisis sekuen mendukung identifikasi secara morfologi bahwa isolat-isolat yang diteliti berbeda jenis. Uji coba 6 strain Nostoc, dalam bentuk inokulum tunggal, sebagai sumber nitrogen untuk padi dilakukan. Sebanyak 2 g biomasa basah dari masing-masing strain Nostoc diinokulasi ke dalam pot-pot yang telah berisi 3 tanaman padi. Percobaan dilakukan di rumah kaca selama 115 hari.

Secara statistik (ANOVA; $\alpha = 0.05$) hanya strain GIA13a yang mempengaruhi panjang akar dan jumlah bulir padi bernaas.

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Abstract

In order to collect Indonesian Nostoc, isolation of soil microflora from several paddy fields in West Java, Bali, and South Celebes was carried out. Fast-growing isolates of Nostoc were selected to describe and perform molecular identification using partial sequences of 16S rRNA. The results showed that partial sequences of 16S rRNA could not resolve the phylogeny of the isolates. However, it supported the morphological studies that recognize isolates as different species of Nostoc. Potential use of Nostoc as a nitrogen source for paddy growth was carried out using six strains as single inoculums. A total biomass of 2 g (fresh weight) for each strain was inoculated, respectively, into the pot planted with three paddy plants. This experiment was conducted in the green house for 115 days. Statistical analyses (ANOVA; $\alpha = 0.05$) showed that of six strains tested in this study, only strain GIA13a had influence on the augmentation of root length and the total number of filled grains.