ABSTRAK

Studi mengenai keragaman gen *nonribosomal peptide synthetase* (NRPS) pada isolat bakteri endofit akar tumbuhan obat *Vetiveria zizanioides* dan *Ageratum conyzoides* telah dilakukan. Tujuan penelitian yaitu untuk mempelajari keberadaan dan keragaman gen NRPS pada sembilan bakteri endofit akar tumbuhan obat. DNA kromosom bakteri telah diisolasi, lalu diamplifikasi dengan metode PCR menggunakan primer yang mentarget domain adenilasi pada gen NRPS. Segmen yang teramplifikasi disikuensing dan dianalisis secara *in silico* dengan metode bioinformatika. Sikuen dengan panjang ± 700 bp teramplifikasi pada tujuh isolat bakteri endofit akar tumbuhan . Hasil bioinformatika menunjukkan bahwa ketujuh amplikon mengkode enzim NRPS dengan domain konservatif yang tergolong superfamili AFD. Motif sikuen yang menentukan substrat NRPS terdeteksi pada tiga sikuen bakteri endofit. Studi filogenetik menunjukkan bahwa gen NRPS pada isolat bakteri endofit *V. zizanioides* mengelompok dengan NRPS pada Gammaproteobacteria, sementara gen NRPS pada bakteri endofit *A. conyzoides* mengelompok NRPS pada Firmicutes. Studi mengindikasikan bahwa gen NRPS bakteri endofit pada masing – masing tumbuhan inang berevolusi secara terpisah.

Kata Kunci : *Nonribosomal Peptide Synthetase*, Bakteri Endofit, *Ageratum conyzoides*, *Vetiveria zizanioides*

ABSTRACT

Study to analyze nonribosomal peptide synthetase (NRPS) gene diversity on bacterial endophyte isolates from roots of *Vetiveria zizanioides* and *Ageratum conyzoides* has been conducted. The aim of the research is to study the presence and diversity of NRPS gene on nine bacterial endophytes from root of medicinal plant. The bacterial DNA chromosomes has been isolated and amplified by PCR methods using primer which targeting adenilation domain of NRPS gene. The amplified segments were sequenced and analyzed *in silico* with bioinformatics methods. The 700 bp length DNA segment have been amplified on seven bacterial endophyte isolates of plant root. Bioinformatics analysis of the DNA sequence showed that all of the amplicon were coding NRPS enzymes that contain conservative domains of AFD superfamily. Sequence motif that determine NRPS substrates detected from three sequences of bacterial endophyte. Phylogenetic studies indicates that NRPS genes from *V. zizanioides* endophytes were grouping with NRPS from Gammaproteobacteria group, otherwise NRPS genes from *A. conyzoides* were grouping with NRPS genes from Firmicutes Group. Study indicates that NRPS genes of bacterial endophytes from each host plants evolved separately.

Keywords: Nonribosomal Peptide Synthetase, Bacterial endophyte, *Ageratum conyzoides*, *Vetiveria zizanioides*