ABSTRACT

Endophytes are the microorganisms that reside in most of the plant tissues without causing any visible disease symptoms and known to promote plant growth and development. Cytokinin is a group of plant growth regulators (PGRs) and known to play an important role in converting etioplasts into chloroplasts, and could be used to increase the shelf-life of leafy-vegetables, cut-flowers and fruits. The objective of this study is to isolate endophytic bacteria from randomly selected dicotyledonous plants and to screen them for cytokinin-like compounds using cucumber cotyledons greening bioassay (CCGB). From field grown plants and or from their natural habitats, plant material samples were collected from various parts of peninsular Malaysia; and five-hundred eight (508) endophytic bacterial isolates were isolated from the collected leaf (and fruits) tissues. Polymerase chain reactions (PCR) were carried out to amplify 16S rDNA of all isolates using respective bacterial lysates and 16S rDNA gene specific primers (Bak11W-F and Bak-R). The amplified PCR products were purified; and DNA sequencing was carried out by outsourcing the DNA sequencing service. The 16S rDNA sequences were analyzed using the BlastN program of the National Center for Biotechnology Information (NCBI). Well isolated single colonies of bacterial endophytes were grown separately in LB medium and ethyl acetate extracts of cell-free broth were used in the CCGB. The total amounts of chlorophyll content in cucumber cotyledon samples was estimated by spectrophotometry and compared with positive and negative controls used in the bioassay. In total, 508 bacterial endophytes are being isolated and identified from sixty-five (65) different dicotyledonous plant species. The 508 isolates belong to 18 genera and 47 different bacterial species. The output of SPSS one-way ANOVA analysis of CCGB data suggests that 62.8% isolates produce compounds which acts like cytokinin. Out of 508 isolates, 86% isolates were from the family *Bacillaceae*; and among the 508 isolates, 28.5% isolates belongs to the *Bacillus cereus*. We hypothesize that the endophytic bacterial isolates of selected dicot plants that produce cytokinin-like compounds might have a role in the growth and development of their host plants. In conclusion, the isolates which produce cytokinin-like compounds could be used in agriculture. However, a suitable mechanisms need to be developed to exploit the lead isolates in agriculture.