

Effect of Soil Nutrient Status on Endophytic Bacterial Diversity and Corn Growth

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ABSTRACT

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Endophytic bacteria are bacteria that are able to live in plant tissue but do not cause disturbances or disease in the host plant. Endophytic bacteria are generally found in the vascular tissue of seeds, stems, leaves and roots. One of the roles of endophytic bacteria is to produce secondary metabolites like those produced by their host plants. One of the secondary metabolites produced is the hormone indole acetic acid (IAA) which plays a role in cell elongation and concentration in plants. The interaction of microorganisms with plants has a good influence on the health, productivity and condition of a plant. The results of interactions between microbes and plants vary and are influenced by many factors, including plant type and nutritional conditions. The aim of this research is to study the diversity of endophytic bacteria in the roots of corn plants and study the growth of corn plants grown in media with different nutrients.

This research is an experimental study designed using a 2 factorial completely randomized design (CRD) which includes different corn varieties and nutrients (ABmix) 1:0;1:5;1:10. There are three varieties of corn plants used, namely Bhisma, Pulut Uri and Raja. Each treatment consisted of 3 replications. The variables observed included the number of bacterial isolates that were successfully isolated from 40 day old corn roots, corn growth which included plant height, leaf length, number of leaves, leaf chlorophyll content, and testing the ability of bacterial isolates to produce IAA.

The results of the research obtained 4 isolates of endophytic bacteria, 1 isolate from pulut uri roots (1:10), 2 from raja roots (control) and 1 from bisma roots (control). The results of the test for the ability to produce IAA showed that the four bacterial isolates were able to produce IAA. The results of the Friedman test analysis showed that the addition of ABmix treatment had a significant effect on the growth parameters of plant height, number of leaves, leaf length and leaf width, but for the type of corn variety it did not have a significant effect on the measured growth parameters. Chlorophyll levels with the ABmix treatment were highest in the ABmix 1:5 treatment for all corn varieties.

Key words: root endophytic bacteria, corn plants, nutritional status, growth

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