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Effect of Biopesticides Neem Extract (*Azadirachta indica*) treatments on Soil Biochemical Properties and Plant Growth Promoting Rhizobacteria Viabilities

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Abstract

Recently the use of biopesticide is becoming popular. The neem seed contains Azadirachtin which is the most important component as a biopesticide. However, it is not known how the effect of this compound on PGPR and soil biochemical properties. This study aims to determine the impact of neem extract biopesticides (*Azadirachta indica*) on the viability and activity of plant growth-promoting rhizobacteria (PGPR). The method used is *in vitro* assay, by implanting disc blank which has been treated with the variation of biopesticide concentration of neem extract by 0% (control), 2.5%, 5% and 10% on 11 isolates of PGPR ie 4a, 4e, III b, PIKO, PP2, AD71, *Pseudomonas*, L7TO3, 140B, AA2, and AA1. In Vivo assay was conducted by applying biopesticide neem extract directly into soil with different concentrations. Soil biochemical properties monitored include soil respiration, PME-ase, and urease in soil samples that have been treated with biopesticides. The results showed that the neem extract biopesticide (*Azadirachta indica*) was able to inhibit eight of 11 PGPR isolates. The eight isolates were 4a, 4e, III b, PIKO, L7TO3, 140B, AA2, and AA1. Meanwhile, PP2, AD71, and *Pseudomonas* isolates were not inhibited. The value of the soil respiration test was proportional to the PGPR population number. In the PME-ase activity, measurement decreased as biopesticide extract treatments at higher concentrations. Similar results were observed in the Urease activity. From this work, it must be considered on the application of biopesticide neem extract in the plantations, because it will produce a negative effect on PGPR and soil biochemical properties.

Keywords: *Azadirachta indica*, PGPR, PME-ase, soil respiration, urease