Efficiency of nitrogen fixation by azotobacter in Sakaerat forest soils.

VILAILUCK SATRULEE.

Thesis. Kasetsart University., 1979.

ABSTRACT

Nitrogen fixation by Azotobacter in the dry dipterocarp and dry evergreen forests were studied at Sakaerat Environmental Research Station, Amphur Pakthongchai, Nakornratchasima province. The total count as well as the moisture content, pH, total nitrogen and other environmental factors of the soils were investigated in order to evaluate the role of Azotobacter in these forest soils.

From the dry dipterocarp forest soils, the ranges of pH and moisture content were 5.20-6.26 and 1.60-17.45 % respectively, lowest in March and highest in July. The total nitrogen varied from 0.05 % in December to 0.07 % in July. On the other hand, the ranges of pH and moisture content from the dry evergreen forests were 4.19-4.68 and 4.35-24.09 % at the same period. The total nitrogen was lowest at 0.10 % in June and reached maximum at 0.12 % in July.

The population of Azotobacter from both types of soils were about the same in the ranges of 10^4 to 10^6 cells per gram of soils. The total counts were closely related with the changes of pH, moisture content and the total nitrogen of the soils.

An investigation on nitrogen fixation of 320 isolates of Azotobacter, it was found that 20 isolates were able to fix nitrogen at relatively high efficiency from 0.35-2.01 mg per litre of the filtrate. Study on the characteristics of the 20 isolates resulted that they belonged to 2 groups which identified as Azotobacter chroococcum and A. paspali.