STUDIES ON THE MECHANISM OF SYMBIOTIC NITROGEN FIXATION

Abstract

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RECENT research on the problem of mechanism of symbiotic nitrogen fixation has led to the following conclusions:

1. If species of *Rhizobium* are able to fix nitrogen non-symbiotically, the essential conditions still await adequate demonstration.

2. Species of *Rhizobium* grown in laboratory culture appear to have identical physiological properties with those taken directly from the nodule.

3. The ability of a given symbiotic plant-bacteria combination to fix nitrogen is dependent not only upon the strain of bacteria employed ("strain variation") but also upon the plant ("host plant specificity").

4. Studies directed toward a knowledge of the characteristics of the responsible enzyme systems involved in nitrogen fixation have demonstrated that:

(a) nitrogen fixation is independent of pN\(_2\) if this exceeds 0.15 atm. Below this value nitrogen fixation decreases in an apparently typical substrate-reactivity curve with a Michaelis constant of about 0.05 atm. Plants given combined nitrogen grow independently of