SYMBIOTIC PROMISCUITY IN THE LEGUMINOSAE

Abstract

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IN THIS study of symbiotic promiscuity in the Leguminosae, plantlets from sterilized seed were grown in flasks on a sterilized substrate that was wetted with a solution containing in suspension the desired strain of Rhizobium. This made it possible to grow the plantlets and the strain together to the exclusion of other strains and to observe whether nodules occurred on the roots. These were the criteria of symbiosis. In addition to reporting tests with strains from each plant-bacteria group, 46 strains were isolated from one species and employed in tests to show that promiscuity is widespread. These strains exhibited adaptation not only to Amorpha fruticosa, from which they were isolated, but also to many other species which are representatives of several plant-bacteria groups. Also growth of the strains from Amorpha fruticosa on media revealed that the strains, as measured by rate of growth, were as variable as that which may be expected from strains from plants representing each of the 16 or 20 plant-bacteria groups that were projected.

Data were presented, also, to show that this promiscuity is closely associated with the degree of self- or cross-pollination and that by knowing the degree of cross-pollination it is possible to predict, to some degree, the extent of promiscuity inherent in a plant. It was observed in connection with the flagellation of strains that plants which are entirely self-pollinated may be also non-nodulating, that plants which are restricted in cross-pollination symbiose mostly with strains highly monoflagellated and that plants which are obligatorily cross-pollinated usually symbiose best with strains highly multiflagellated although such plants may symbiose with strains possessing variable degrees of flagellation.—Author abstract.

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