

COMPARATIVE STUDY OF THE AMOUNTS OF PIGMENTS IN MUNG BEAN AND PEANUT PLANTS INOCULATED WITH NODULE-FORMING BACTERIA

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We have determined the amounts of carotene and chlorophyll in the leaves of mung bean and peanut plants inoculated with highly effective strains of nodule-forming bacteria. To determine the amounts of pigments we used a spectrophotometric method [1].

Fresh green leaves of the plants (leaves and leaf blades of the spadix involucre) were used. We took three 0.25-g samples from the ground leaves of three plants. Cut-up pieces of the material were ground in an ordinary mortar with the addition of glass powder. The pigments were extracted with 100% acetone and were determined on a SF-26 spectrometer.

We used two varieties of mung bean – Pobeda-104 and VIR-628, the seeds of which were inoculated with strain 1901 of *Rhizobium*, and also two varieties of peanut – Tashkentskii-32 and Tashkentskii-112, the seeds of which were inoculated with the highly effective strain 33(0104) of *Rhizobium*. The strains of nodule-forming bacteria were obtained from the VNIISKhM [All-Russian Scientific Institute of Agricultural Microbiology] (St. Petersburg). Samples of the leaves of the plants for determining pigments were taken at the end of mass flowering – beginning of budding.

As a result of the experiments performed, we detected a considerable difference in the amounts of pigments between the control (without inoculation) and the experimental (inoculated with nodule-forming bacteria) variants. The results obtained are given in Table 1.

In the leaves of the mung bean plants that had not been inoculated with bacteria, the amounts of chlorophyll per 100 g were 539.2 mg in variety Pobeda-104 and 410 mg in variety VIR 628, and the amounts of carotene 65.6 and 27.6 mg, respectively. In the inoculated plants, the amounts of chlorophyll per 100 g were 1761.4 and 1471.0 mg and those of carotene 90.6 and 82.4 mg, respectively for the two varieties.

The amounts of chlorophyll and carotene per 100 g in the peanut variety Tashkentskii-32 were 247.9 and 20.8 mg, respectively, in the noninoculated plants, and in the leaves of the inoculated plants 1016.7 and 43.0 mg, respectively. In the variety Tashkentskii-112, the amounts of chlorophyll and carotene per 100 g of fresh leaves in the plants without inoculation were 363.9 and 30.4 mg, and in the leaves of the inoculated plants 684.4 and 37.9 mg, respectively.

TABLE 1. Amounts of Pigments in Mung Bean and Peanut Plants Inoculated with Nodule-forming Bacteria (mg/100 g of fresh green leaves)

Variety	Chlorophyll		Carotene	
	without inoculation	with inoculation	without inoculation	with inoculation
Mung bean				
Pobeda-104	539.2	1761.4	65.6	90.6
VIR-628	410.0	1471.0	27.6	82.6
Peanut				
Tashkentskii-32	247.9	1016.7	20.8	43.0
Tashkentskii-112	363.9	684.8	30.4	37.9

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Thus, the inoculation of the seeds of legumes with highly effective strains of nodule-forming bacteria causes a considerable increase in the amounts of chlorophyll and carotenoids.

REFERENCE

1. P. Boger, *Phytochemistry*, No. 4, 435 (1965).