BIOCHEMICAL STUDIES ON AZOSPIRILLUM BACTERIA IN THE RHIZOSPHERE OF SOME FIELD CROP PLANTS

BY

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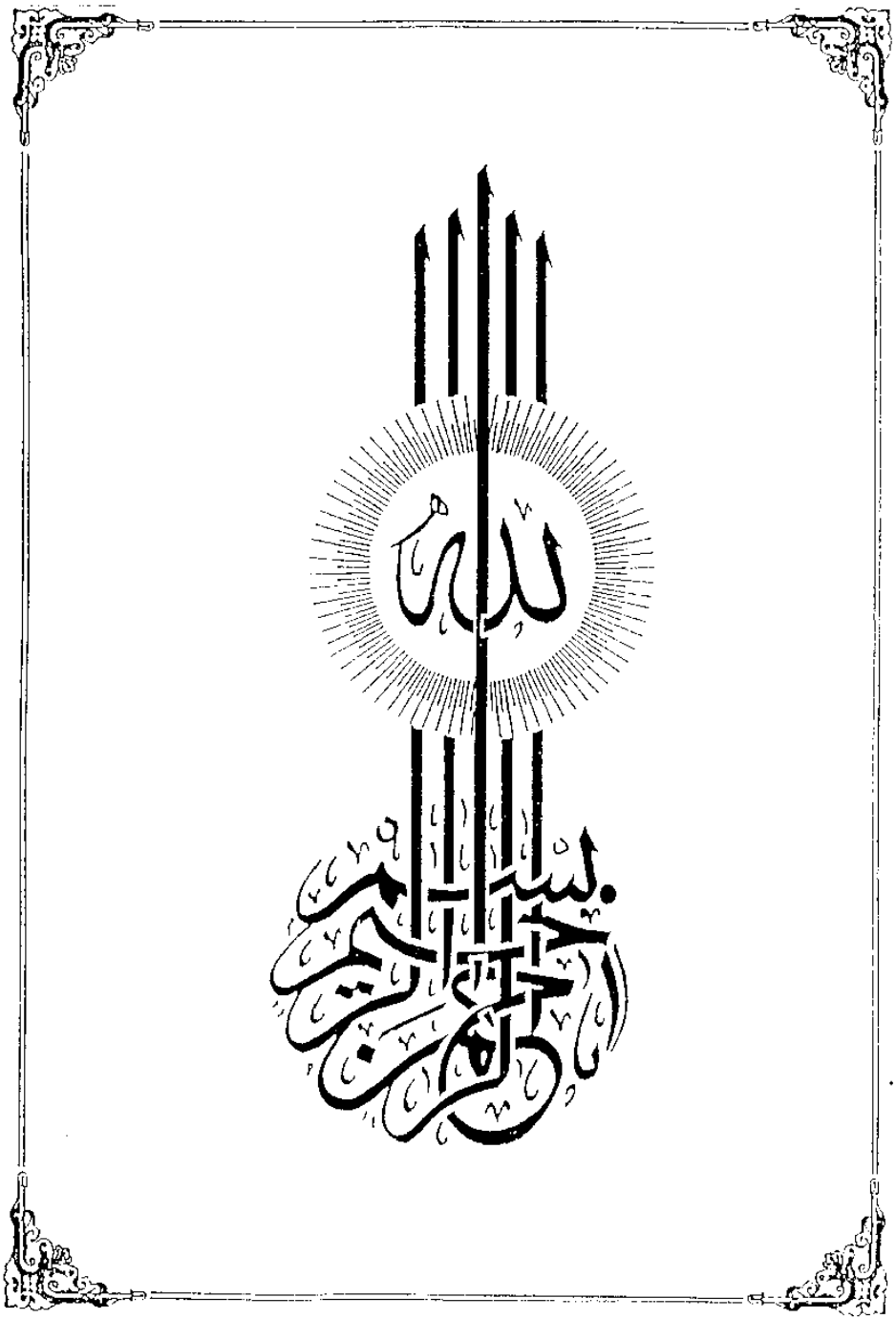

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ABSTRACT

Two field experiments were conducted at Sakha Agriculture Research Station, on rice (var. Giza 172) and two wheat varieties (Sakha 8 & 69) to investigation the effect of inoculation of these cereals with nitrogen fixing bacteria namely Azospirillum brasilense (strain Sp7 & Sp245) as a bio-fertilizer under different N-fertilizer levels, on grain yield and chemical constituents of grain like carbohydrates contents, protein fractions using different solvents and electrophoretic patterns (SDS-PAGE).

Irrispective of N-fertilization, grain yield non-significantly increases were found due to inoculation of wheat var. Sakha 69 with strain Sp7 or Sp245, these increases scored 13.14 % and 27.04 % over the control, respectively. Whereas decreases in grain yield were occured upon bio-fertilization of both of rice and wheat var. Sakha 8.

The inoculation increased, significantly, crude protein percentage of two wheat varieties used and highly significant for rice. These increases represented 6.50 %, 3.38 % and 14.50 % for wheat upon inoculation with Sp245 and Sp7 and for rice with Sp7, respectively.

The biofertilization with strain Sp245 increased, non-significantly the gliadins content (25.36 %) for wheat var. Sakha 69, and the inoculation with the same strain increased glutenins content by 16.22 % of grain in var. Sakha 8 over the control.

Total soluble carbohydrates percentage decreased due to inoculation of two wheat varieties used, whereas increased for rice grain non-significantly, especially without N-fertilization. It is clear that the biofertilization compensed the negative effect of the N-fertilization in rice grain.

Separation of grain total protein of wheat var. Sakha 8 using SDS-PAGE showed that the inoculation gave a new hand of 42.6 kd. Also, inocilation with Sp245 led to new two bands of about 62.0 and 72.0 kd. Both of two fertilization types gave some more intensity bands than the control in the electrophoregrams of rice grain total protein. Gliadins electrophoregrams for two wheat varieties used were unaffected by inoculation or/and N-fertilization. The data of glutenins subunits protein of wheat grain var. Sakha 69 showed that the inoculation gave less intensity bands. In var. Sakha 8, inoculation with strain Sp245 at 30 kg N/Fed, also, applying 60 kg N/Fed led to most of bands density than control.

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