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التوثيق الالكتروني والميكرو فيلم

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**SEQUENTIAL DISTRIBUTION OF BLUE-GREEN
ALGAE IN PADDY FIELDS UNDER DIFFERENT
AGROCHEMICAL FACTORS WITH SPECIAL
REFERENCE TO THEIR BIOLOGICAL
ACTIVITIES**

By
**BELAL ABD EL-SAMIE AHMED
KANDIL**

B.Sc. Agric. Sci. (Soil Sciences)
Fac. Agric., Cairo Univ., 1976

*A thesis submitted in partial fulfillment
of
the requirements for the degree of*

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APPROVAL SHEET

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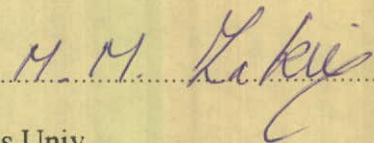
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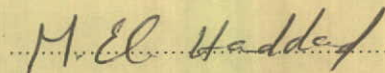
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ABSTRACT

Belal Abd El-Samie Ahmed Kandil, Sequential Distribution of Blue-green Algae in Paddy Fields Under Different Agrochemical Factors With Special Reference to Their Biological Activities, Unpublished Master of Science, University of Ain-Shams, Faculty of Agriculture, Department of Microbiology, 1997.

A hundred samples were collected from rice fields located at Kafr El-Sheikh, El-Gharbia and El-Beheira Governorates to isolate the dominant cyanobacteria. Three out of sixty isolates of cyanobacteria were purified as bacterial free unialgal cultures and identified as strains of *Anabaena cylindrica*, *Aulosira fertilissima* and *Nostoc muscorum*. Those strains variably responded to increased concentrations of ammonical N (0, 2, 4, 6, 8, 10, 12 and 14 ppm N) or the recommended concentrations of the herbicides, Londax (0.03 ppm), Sindax (0.08 ppm) and Londax + Ordram (0.03 + 10 ppm) when added to the culture medium. While the growth rate of *Anabaena cylindrica* GH 11 was decreased with increased N-concentration, *Nostoc muscorum* KS 51 was relatively more tolerant. However, herbicide supplemented media appeared to support higher level of growth of the 3 strains than the untreated controls. In this respect, the dry weight of *Aulosira fertilissima* KS 35 and *Nostoc muscorum* KS 51 were greater than that of *Anabaena cylindrica* GH 11. The interacting effects of mixed cyanobacterization with the abovementioned strains, N-fertilization and herbicides application on the development of the inoculated cyanobacteria and rice performance gave interesting results. Densities of the colony-forming unit (CFU) of cyanobacteria sharply increased with cyanobacterization especially when combined with the application of 72 rather than 144 kg N/ha. Moreover, application of (Londax + ordram) stimulated field colonization with cyanobacteria compared with the 2 other herbicides which showed a retarding effect. Microscopic examination revealed that *Aulosira fertilissima* KS 35 failed to propagate in the rice field under experimentation. Generally, *Anabaena cylindrica* GH 11 was more dominant compared with *Nostoc muscorum* at different stages of rice growth and under the influence of the two

studied factors. However, a balanced state between the proportional existence of the two strains was reported after harvest. The effect of cyanobacterization on rice performance was found to vary according to the pattern of weed control and the amount of N dose. This finding was observed in the records of growth, yield and N uptake by rice plants. For example, increase in grain yield were accounted for 2.0 and 13.8% with cyanobacterization and handweeding plus fertilization with 72 and 144 kg N/ha, respectively. The corresponding increases due to the application of Sindax and (Londax + Ordram) were 29.6 and 43.0% under the same abovementioned conditions, respectively.

Key Words: Blue-green algae, Cyanobacteria, *Anabaena cylindrica*, *Aulosira fertilissima*, *Nostoc muscorum*, N₂-fixation, Rice G. 175, Herbicides, Urea, N-fertilizer, Growth and yield responses, Cyanobacterization.

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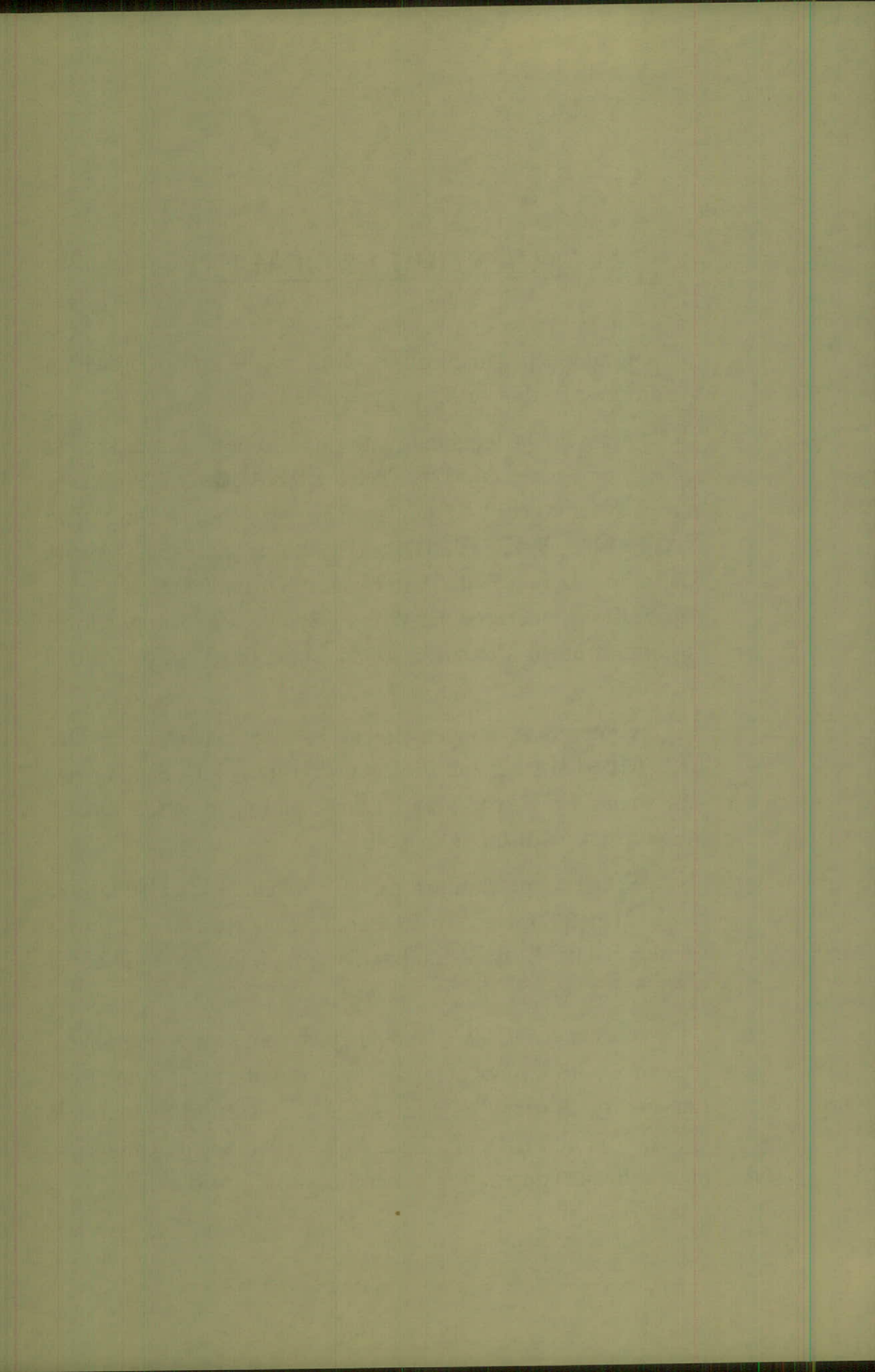
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C O N T E N T S

	<u>Page</u>
LIST OF FIGURES	
LIST OF TABLES	
1. INTRODUCTION	1
2. REVIEW OF LITERATURE	3
2.1. Ecological distribution of cyanobacteria in rice ecosystem	3
2.2. Effect of inoculation with cyanobacteria on growth and performance of rice crop	4
2.3. Effect of fertilizer nitrogen on growth N ₂ -fixation and contribution of cyanobacteria to rice crop	9
2.4. Effect of pesticides on cyanobacteria under laboratory and field conditions	12
3. MATERIALS AND METHODS	20
3.1. Materials	20
3.1.1. Core samples	20
3.1.2. Nitrogenous and phosphatic nutrients	20
3.1.3. Herbicides	20
3.1.4. Rice seeds	21
3.1.5. Soil used	22
3.1.6. Media used	22
(A) Go medium	22
(B) BG 11 medium	23
(C) Modified Watanabe medium	24
3.2. Methods	24
3.2.1. Experimental techniques	25
3.2.1.1. Core sampling of cyanobacteria from rice field	25
3.2.1.2. Isolation and purification of dominant cyanobacteria from samples representing different sites	25
3.2.1.3. Characterization and identification of the selected cyanobacterial isolates	26
3.2.1.4. Preparation of standard cyanobacterial inocula for laboratory studies	26
3.2.2. Laboratory studies	27
3.2.2.1. Effect of nitrogen concentration on growth of the cyanobacterial strains	27
3.2.2.2. Effect of different herbicides on growth of the cyanobacterial strains	27
3.2.3. Effect of inoculation with cyanobacteria on rice growth, yield, N uptake and other related parameters under field conditions	28
a) Preparation of rice nursery	28
b) Transplantation of rice seedling	28
c) Preparation of the cyanobacterial inocula for field experiment	30
d) Nitrogen fertilization	30
e) Weed control	30