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A Growth Factor for Rhizobia

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THE NUMBERS OF NITROSOMONAS IN SOME VARIOUSLY TREATED IOWA SOILS

R. H. WALKER, A. A. KLINGEBIEL AND L. M. GREINER

A study was made of the numbers of Nitrosomonas, bacteria capable of oxidizing ammonia to nitrite, in variously treated soils of the Agronomy Farm at Iowa State College, and of certain other soils of the state. The dilution method, as modified by Wilson for the study of these organisms was employed for making the determinations.

The results of this study indicate that the numbers of Nitrosomonas in soils varies considerably. The number present in soils is undoubtedly affected by such factors as the fertilization, cropping, and cultivation, the organic matter content, the hydrogen-ion concentration, the moisture content of the soil and the season of the year. The pH and buffer capacity of the soil are probably major factors in determining the numbers of Nitrosomonas in soils otherwise suited to their growth.

DEPARTMENT OF SOILS
IOWA STATE COLLEGE,
AMES, IOWA.

A GROWTH FACTOR FOR RHIZOBIA

D. W. THORNE AND R. H. WALKER

A study of the nutritional requirements of the root-nodule bacteria has demonstrated the necessity of an accessory factor for their growth. Two species of Rhizobium were studied. They were not able to maintain growth when continuously cultivated in a synthetic medium containing only C. P. chemicals, including mineral salts, a nitrogen source of KNO_3 , and sucrose. Upon replacing the C. P. sucrose with commercial cane sugar the organisms were able to grow. Presumably cane sugar contains a factor necessary for the growth of rhizobia. A concentrated preparation of the growth substance was prepared by extracting cane sugar with absolute alcohol. Yeast extract contains sufficient of the factor to initiate maximum growth of the organisms. The stimulative factor is destroyed by alcoholic extraction. These

results confirm the report of Allison and Hoover of an accessory factor for Rhizobium.

Asparagin, aspartic acid and related compounds were not able to replace the growth factor, but acted as very readily available sources of nitrogen. The organisms were able to attack the amino group of asparagin with greater ease than the amid group. The two carboxyl groups increased the availability of the amino group and also promoted the growth of the organisms.

DEPARTMENT OF SOILS,
IOWA STATE COLLEGE,
AMES, IOWA.

SELF-PARASITISM IN *ACHLYA RACEMOSA* HILDB.

MYRLE M. BURK

In cultures of *Achlya racemosa* Hildb. oospores in the oogonium were completely absorbed by hyphae arising from antheridia or from the wall dividing the oogonium and stipe.

WATERLOO, IOWA.

DEPOSIT OF SILICA IN *ACER SACCHARINUM* L.

MYRLE M. BURK

Report of a small quartz pebble found imbedded in the wood of *Acer saccharinum* L.

WATERLOO, IOWA.

NUTRITIONAL PHYSIOLOGY OF CERTAIN DIOECIOUS PLANTS

W. F. LOEHWING AND L. C. BAUGUËSS

Further study has been made of the metabolic expression of sex in shoots of typical dioecious hemp plants. Results obtained show significant differences in metabolism of corresponding shoot regions of the two sexes before as well as after the development of sexual dimorphism.

DEPARTMENT OF BOTANY,
STATE UNIVERSITY OF IOWA,
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