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J.S.S ARTS,SCIENCE AND COMMERCE DEGREE COLLEGE

GOKAK

PROJECT WORK

ISOLATION AND IDENTIFICATION OF AZOTOBACTER FROM SOIL

NAME: I VITTHAL HOSUR

CLASS: B Sc VI Sem

REG.NO: S191.7247

MENTOR: Prof Dr T.C.Gopal

Prof R M Mahendrakar

J.S.S ARTS, SCIENCE, COMMERCE B.B.A COLLEGE AND P.G DEPARTMENTS, GOKAK- 591307

DEPARTMENT OF BOTANY

CERTIFICATE

This is to certify The Project report, submitted by

Mr. VITTHAL. HOSUR Reg.No. 81917247

for the Partial fulfillment of Practical in **Botany , VI** semester for year 2021-22 as prescribed Rani Channamma University Belgavi, is based on **ISOLATION AND IDENTIFICATION OF AZOTOBACTER FROM SOIL**

conducted under my supervision.

HOD

Prof. Dr.T.C.Gopal
Head of the
Botany Department
L. B. S. Science College
GOKAK

Prof. R.M.Mahendrakar

ISOLATION AND IDENTIFICATION OF AZOTOBACTER FROM SOIL OF Kuligod region REGION

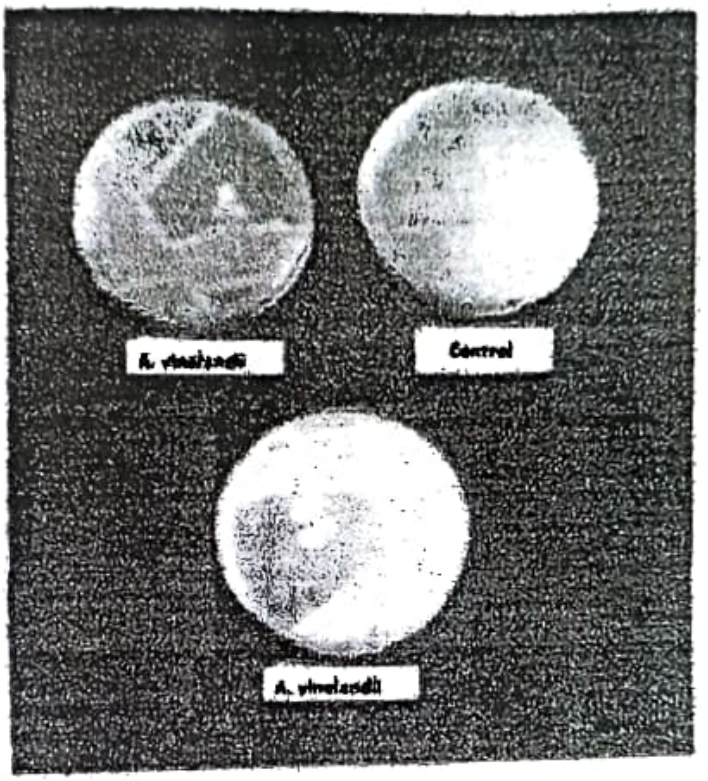
Introduction

Azotobacter in soil: In Indian soils, the population of Azotobacter is not more than 10 thousand to 1 lakh/g of soil. The population of Azotobacter is mostly influenced by other microorganisms present in soil. There are some microorganisms, which stimulate the Azotobacter population in soil thereby increasing the nitrogen fixation by Azotobacter. On the other hand there are some microorganisms, which adversely affect the Azotobacter population and hence nitrogen fixation process is hampered. For example Cephallosporium is most commonly found organisms in soil, which restricts the growth of Azotobacter. Azotobacter also produces some substances, which check the plant pathogens such as Alternaria, Fusarium and Helminthosporium. Hence Azotobacter also acts as a biological control agent.

Functions of Azotobacter: Azotobacter naturally fixes atmospheric nitrogen in the rhizosphere. There are different strains of Azotobacter each has varied chemical, biological and other characters. However, some strains have higher nitrogen fixing ability than others. Azotobacter uses carbon for its metabolism from simple or compound substances of carbonaceous in nature. Besides carbon, Azotobacter also requires calcium for nitrogen fixation. Similarly, a medium used for growth of Azotobacter is required to have presence of organic nitrogen, micronutrients and salt in order to enhance the nitrogen fixing ability of Azotobacter.

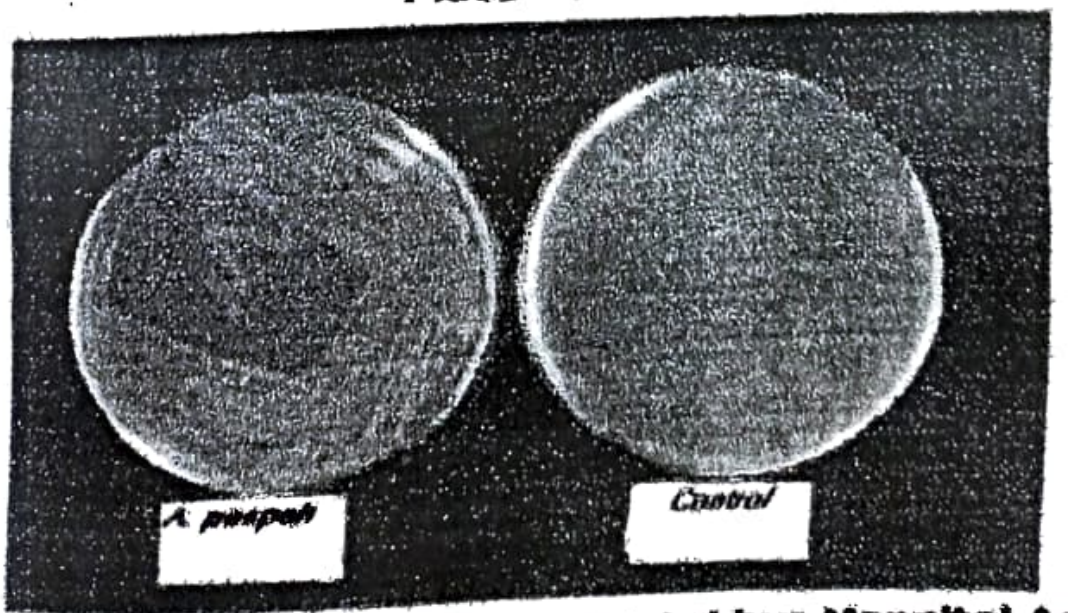
Sr. No.	Sample number	Name of the organsms
1]	VMP1, VMP3,	*A. vinelandii*
2]	VMP2,	*A. paspali*

Plate No. 3.1



Growth of Azotobacter spp. On Ashbys Mannitol Agar

Plate No. 3.2



Growth of Azotobacter spp. On Ashbys Mannitol Agar

DISCUSSION

The dominant nonsymbiotic nitrogen fixing heterotrophic bacterium in Indian soils is *Azotobacter chroococcum*, *A. vinelandii*, *A. insigns*, *A. armeniacus*, *A. nigricans* and *A. beijerinckii* (Mulder and Brotonegoro, 1974). Azotobacter rarely exceeds 10^4 to 10^5 microorganisms per gram in Indian soils and cellulolytic microorganisms, which degrade plant residues, encourage the proliferation (Iswaran and Subba Rao, 1966).

The data showed that out of 10 soil samples collected, 3 samples were positive for non-symbiotic nitrogen fixing Azotobacter. On the basis of morphological, cultural and biochemical characteristics of these 3 samples showed two different species of Azotobacter. The morphological characterization performed as gram staining, motility, cyst formation and pigment production with the help of Bergeys manual of determinative bacteriology. Differentiation of Azotobacter spp. were made and identified as *Azotobacter Azotobacter vinelandii* and *Azotobacter paspali* The data further indicated that, in black soil of kuligod *A. paspali* were less in number as compared to *A. vinelandii*

Co-ordinator, IQAC
J.S.S. Arts, Science & Commerce, College, Gokak.

PRINCIPAL
J.S.S. ARTS, SCIENCE AND COMMERCE COLLEGE, GOKAK.

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GOKAK

PROJECT WORK

ISOLATION OF RHIZOBIUM CULTURE

NAME :SHRUSHTI S DAPPADHULI

CLASS: B.Sc VI sem

REG.NO: S1917219

MENTOR: Prof.R.M.Mahindrakar

J.S.S Degree College Gokak

ACKNOWLEDGEMENT

We Sincerely express our deep sense of gratitude to our Prof. Mahindrakar sir, Dept. of Botany, J.S.S Degree College Gokak, for this valuable guidance, suggestions and encouragement throughout this project.

We are thankful to our HOD, Dr. T C Gopal, Dept. Of Botany, for providing necessary facilities to carryout the Project report on "ISOLATION AND IDENTIFICATION OF RHIZOBIUM FROM SOIL"

Our special thanks to our Principal Dr. A.S. Terdal for their valuable support in permitting this project report.

Date: 30/8/22
Place: Gokak

Miss.SHRUSHTI
Reg. No.S1917219

J .S.S ARTS, SCIENCE, COMMERCE B.B.A COLLEGE AND P.G DEPARTMENTS, GOKAK- 591307

DEPARTMENT OF BOTANY

CERTIFICATE

This is to certify The Project report, submitted by

Miss. SHRUSHTI S DAPPADHULI Reg.No: S1917219

for the Partial fulfillment of Practical in Botany, VIth semester for year 2021-22 as prescribed Rani Channamma University Belgavi, is based on "ISOLATION AND IDENTIFICATION OF RHIZOBIUM FROM SOIL OF GHATAPRABHA KARNATAKA REGION" conducted under my supervision.

HOD

Dr. T.C. Gopal

Dept. of studies in Botany

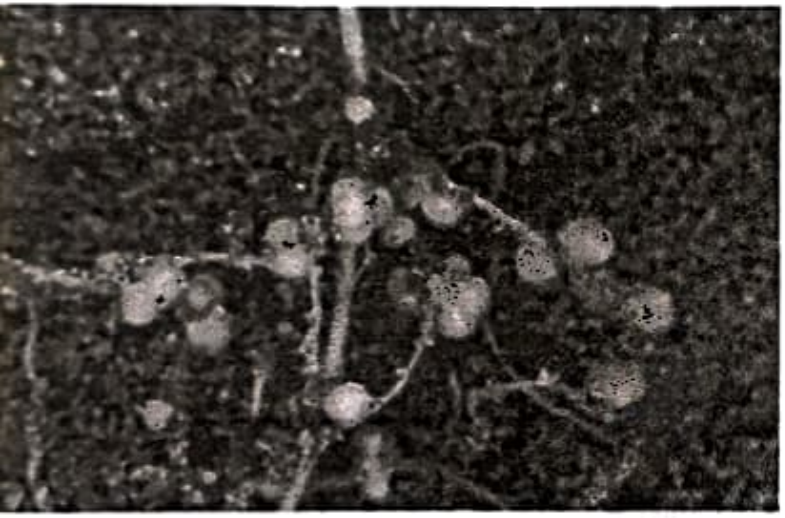
Gokak

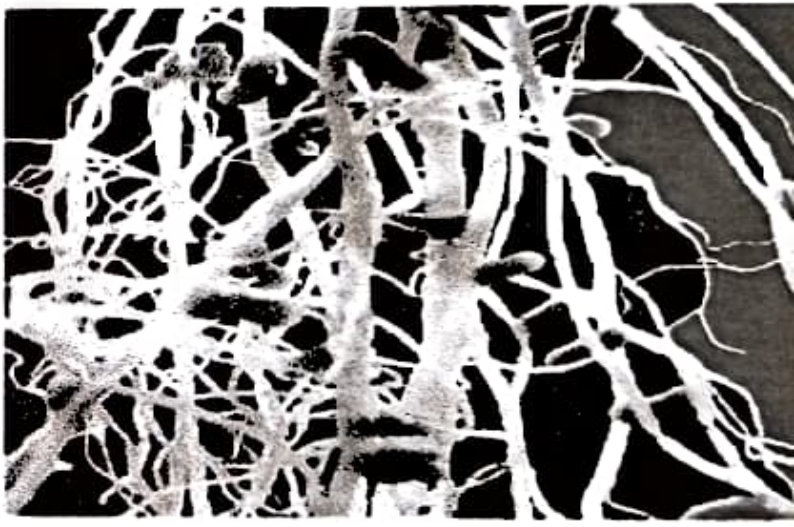
Head of the Botany Department J. S. S. Science College GOKAK

Prof. R. M. Mahindrakar.

Dept.of studies in Botany

J.S.S Degree College





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J.S. S. ARTS, SCIENCE AND COMMERCE COLLEGE, GOKAK

(AFFILIATED TO RANI CHANNAMMA UNIVERSITY, BELAGAVI)

DEPARTMENT OF BOTANY

PROJECT WORK ON WATER ANALYSIS

Topic :To Determine the Alkalinity of water

From .....Gokak falls.....

Class : B.Sc Fifth Sem

Reg No : S1937212

Name Of The Student : Smita. A. Thorat.

Staff Incharge

Gopal
HOD

Gokak Education Society's

J.S.S ARTS, SCIENCE, COMMERCE, B.B.A COLLEGE AND P.G DEPARTMENT,
GOKAK 591307

DEPARTMENT OF BOTANY

CERTIFICATE

THIS IS TO CERTIFY THAT THE PROJECT REPORT, SUBMITTED BY Mrs. Smita Appasaheb Thorat. Reg. 219172 12 IN BOTANY IN 5TH SEMESTER 2021-2022 AS PRESCRIBED BY RANI CHENNAMMA UNIVERCITY BELAGAVI IS BASED ON PROJECT REPORT.

HOD
Dr. T C GOPAL
Dept of studies in botany
J S S Degree College, Gokak

Valued

Prof. Mahendrakar Sir
Dept of studies in botany
J S S Degree College, Gokak

Determination of water analysis

Date Tested : 11/01/2022

Tested By : Smita A. Thorat.

Project Name : To determine the alkalinity of water

Sample Number : 01

Sample Location : Gokak

Sample Description : River water, Gokak falls.

Table -2 Total Alkalinity:

Sl.No.	Volume of Sample (mL)	Burette Reading (mL) Initial	Final	Volume of Sulphuric acid (mL)
1.	50	0.3	4.4	4.1
2.	50	6.0	10.2	4.2
3.	50	10.2	14.3	4.1

mean = 4.1

Calculation:

Volume of Sulphuric Acid: 4.1 mL
Normality of Sulphuric : 0.02 N
Volume of Sample : 50 mL
Equivalent weight of $CaCO_3$: 1000

Total Alkalinity = (volume of H_2SO_4(v1)* Normality * 50 * 1000) / Volume of sample taken

Alkalinity as CaCO3 equivalent (mg/L)= 4.1 x 0.02 x 50 x 1000/100

= 41 mg/L as $CaCO_3$ equivalent

Sample 3 - P = 0 T - 4.1 ⇒ T = 41

P < ½ T P = 0 . T = 41

CO_3^{2-} = 2P = 0

HCO_3^{2-} = T - 2P = 41 - 2 x 0
= 41 mg/L

Determination of water analysis Data Sheet

Date Tested : 11/03/2023
Tested By : Smita A Thoral
Project Name : To determine the alkalinity of wate
Sample Number : 02
Sample Location : Gokak
Sample Description :

Table -1 Phenolphthalein Alkalinity:

Sl.No.	Volume of Sample (mL)	Burette Reading (mL) Initial	Final	Volume of Sulphuric acid (mL)
1.	50	16	16.1	0.1
2.	50	19	19.1	0.1
3.	50	21	21.1	0.1

Calculation

Volume of Sulphuric Acid: 0.1 mL
Normality of Sulphuric : 0.02 N
Volume of Sample : 50 mL
Equivalent weight of $CaCO_3$: 1000
Phenolphthalein Alkalinity = (volume of H_2SO_4(v1)* Normality * 50 * 1000) / Volume of sample taken

Alkalinity as $CaCO_3$ equivalent (mg/L)= 0.1 x 0.02 x 50 x 1000/100

= 1 mg/L as $CaCO_3$ equivalent

INFERENCE

Alkalinity is a measure of the capacity of water to neutralize acids. The predominant chemical system present in natural waters is one where carbonates, bicarbonates and hydroxides are present. The bicarbonate ion is usually prevalent. However, the ratio of these ions is a function of pH, mineral composition, temperature and ionic strength. Water may have a low alkalinity rating but a relatively high pH or vice versa, so alkalinity alone is not of major importance as a measure of water quality. Alkalinity is not considered detrimental to humans but is generally associated with high pH values, hardness and excess dissolved solids. High alkalinity waters may also have a distinctly flat, unpleasant taste. Based on the testing, it is found that the alkalinity of the sample is I = 205 mg/L, II = 11 mg/L mg/L. As per the provisional code, alkalinity should not exceed 200 mg/L for potable water. For the fresh water alkalinity ranges between 20 – 100 mg/L. Alkalinity of tested sample is within/above the limits specified in the standards.

Hence the water sample is fit / unfit for drinking.

So,

Sample I is unfit for drinking

Sample II is fit for drinking.

Co-ordinator, IQAC
J.S.S. Arts, Science & Commerce, College, Gokak.

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J.S.S. ARTS, SCIENCE AND COMMERCE COLLEGE, GOKAK.

Gokak Education Society's

J.S.S ARTS, SCIENCE, COMMERCE, B.B.A. COLLEGE AND P,G. DEPARTMENTS, GOKAK.-591307

DEPARTMENT OF BOTANY

CERTIFICATE

This is to certify that the study tour report, Submitted by Sachin Rajavnagol ***(Reg No:*** S1817197 ***),*** *for the partial fulfillment of practical in Botany, 3rd semester for year 2019-20 as prescribed by Rani Channamma University Belagavi, is based on study tour conducted under my supervision.*

HOD

Dr. T C Gopal

Dept. of studies in Botany

J.S.S. Degree College, Gokak

prof. H S Dasar

Dept. of studies in Botany

J.S.S. Degree college , Gokak

JSS ARTS SCIENCE COMMERCE DEGREE COLLEGE GOKAK

BOTANY PROJECT

METHODS USED IN EFFLUENT TREATMENT BY INDUSTRIES

CLASS : BSC Vth

SUBJECT : Botany - II

REG.NO : S1716161

Prema. V. Meti

SIGNATURE OF TEACHER

Gopal 18/10/19

SIGNATUE OF H.O.D

APPU

Gokak Education Society's

J. S. S. ARTS, SCIENCE, COMMERCE, B.B.A. COLLEGE AND P.G. DEPARTMENTS, GOKAK – 591 307

DEPARTMENT OF BOTANY

PROJECT WORK

NAME: SHREYA.S.BANAKARI

REG : S1616223

TOPIC –
INTEGRATED FARMING

HOD:

Dr.T.C.Gopal

Dept of studies in Botany

J.S.S Degree college Gokak

Staff:

Prof:Mahendrakar & Sudharshan

25/10/18

Dept of studies in Botany

J.S.S Degree college Gokak

framing 1) 2)

Problems of present agriculture

- Decline in agriculture growth rate
- Decline in factor productivity
- Static or decline in food production
- Increasing malnutrition
- Shrinkage in net cultivable area
- Increasing environmental pollution
- Depleting ground water table
- Increasing cost of production
- Low farm income
- Problems of Farm labours due to large scale migration

What is the solution?

"Integrated Farming System"

INTEGRATED FARMING SYSTEMS
IFS
GETTING MORE OUT OF EVERY ACRE

Source: http://planningcommission.nic.in/plans/planrel/fiveyr/1st/1planch18.html

Co-ordinator, IQAC
J.S.S. Arts, Science & Commerce, College, Gokak.

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J.S.S ARTS ,SCIENCE, COMMERCE, B.B.A COLLEGE AND POST GRADUATE DEPARTMENTS, GOKAK

(NAAC Re-accreditation : "A" Grade Institution)

Department of Botany

PROJECT REPORT ON

"TREATEMENT OF INDUSTRIAL EFFLUENTS IN A BIOREACTOR"

SUBMITTED BY:-

Savita Hosapeti

REG NO. S1616194

UNDER THE GUIDANCE OF

Mr. Mahendrakar

Examiners.
1) 4/11/2018
2) 4/11/18

CERTIFICATE

This is to certify that the project entitled, "TREATEMENT OF INDUSTRIAL EFFLUENTS IN A BIOREACTOR" submitted by Miss Savita Hosapeti Reg No. S1616194 in partial fulfillments for the botany project, V Sem for year 2018-19 as prescribed by the Rani Channamma University Belagavi is based on "TREATEMENT OF INDUSTRIAL EFFLUENTS

HOD
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Prof . Mahendrakar
Dept of studies in botany
J S S Degree College Gokak

Analytical methods for water quality parameters

BOD-The quantity of oxygen required by the microorganisms for the stabilization of the biological decomposable organic matter. BOD tests measure the molecular oxygen utilized during a specified incubation duration for the biochemical degradation of organic material and the oxygen used to oxidize inorganic material such as ferrous iron and sulfides. The most common BOD test consists of a 5 day period in which a sample is placed in an airtight bottle under controlled conditions temperature (20°C ± 1°C), keeping any light from penetrating the sample to prevent photosynthesis. The Dissolved Oxygen (DO) in the sample is measured before and after the 5 day incubation period, and BOD is then calculated as the difference between initial and final DO measurements. BOD can be considered a more "natural" test in determining the oxygen required to oxidize organic matter.

COD

- Chemical oxygen demand test determines the oxygen required for chemical oxydation of organic component as well as the no. of inorganic component with the help of strong oxidant i.e. potassium dichromate.

- Once oxidation is complete, the excess potassium dichromate is titrated with ferrous ammonium sulfate (FAS) until all of the excess oxidizing agent has been reduced to Cr^{3+}. Typically, the oxidation-reduction indicator Ferroin is added during this titration step as well. Once all the excess dichromate has been reduced, the Ferroin indicator changes from blue-green to reddish-brown.

- COD is often preferred for daily analysis since it is inherently more reproducible, accounts for changing conditions and takes a short time to complete.

Co-ordinator, IQAC
J.S.S. Arts, Science & Commerce, College, Gokak.

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J.S.S. ARTS, SCIENCE AND COMMERCE COLLEGE, GOKAK.