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RESEARCH ARTICLE

THE EFFECT OF TEMPERATURE AND CARBOHYDRATES SOURCES ON GROWTH OF RHIZOBIUM

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ABSTRACT

To study the effect of different temperature and carbohydrate sources, a laboratory experiment was taken and parameters are taken separately. To study the effect of different temperature on the growth of Rhizobium, YEMA medium was used for growth of Rhizobium, there is less growth as compared to 30 c, where significantly increase in biomass growth, up to 30 c temperature. To study the effect of different carbohydrate sources, the Richard medium was used to study the growth of Rhizobium. From data it was clear that, mannitol as a source there was significantly more growth of Rhizobium compared to other sources.

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INTRODUCTION

The effect of temperature and carbohydrates sources on growth of Rhizobium have been reported different workers in pot culture experiment and laboratory, Rhizobium culture experiments. El shikh, E.A.E. and M. wood et al., 1989 observed that effect of temperature and carbohydrate sources on chickpea and soybean varieties rhizobia. The effect of four temperature three PH values and three Na cl concentrations on growth and multiplication of chickpea Rhizobium strain 2-ICAR-SYR-Ch-184 showed that salts-stress was more sever at alkaline PH and lower temperature. The result indicates that tolerance to salts by rhizobia is dependent up on PH temperature and carbon sources. Hugria, Mariangela and Avilio Antinio 1993 observed that the effect of high temperature on nodulation and nitrogen fixation by Phaseolus vulgaris L. They observed at high temperature , the nodulation ability was not related to the capacity to grow or produce melanin-like pigment in culture media at high temperature.

MATERIALS AND METHODS

To study the effect of temperature and carbohydrate sources, for growth of Rhizobium were taken more three prominent strains.

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These strains were cultured on YEMA broth in six replications. The conical flasks were incubated at graded temperature of 15, 20, 25, 30, 35, and 40 c for seven days. The biomasses of rhizobia were taken after filtration through bacteria proof filter. For studying the most effective carbohydrate sources were glucose, fructose, sucrose, starch, mannitol and peptone. Three prominent strains were incubated on broth having six replications. The inoculated flasks were inoculated at 28 +- 2 c for seven days. After filtration biomass was measured.

EXPERIMENTAL RESULTS

To study the effect of different temperature and carbohydrate sources, a laboratory experiment was taken and parameters are taken separately. To study the effect of different temperature on the growth of Rhizobium, YEMA medium was used for growth of Rhizobium, and data are tabulated in table 21. Different temperatures are T1=15, T2=20, T3=25, T4=30, T5=35, T6=40 c. From data it is clear that at 30 c temperature there was more growth and biomass occurred and at low temperature. There was less growth as compared to 30 c temperature growth. At high temperature there was less growth as compared to 30 c temperature. And at 15 c temperature, there was less growth of Rhizobium, where significantly increase in biomass growth, up to 30 c temperature, significantly reduces growth of Rhizobium.

Table 21. Effect of different temperature on growth of Rhizobium

Treatment	Growth of Rhizobium on culture media
T1- 15 c	88.49
T2- 20 c	106.50
T3- 25 c	155.55
T4- 30 c	205.33
T5- 35 c	187.27
T6- 40 c	87.23
SE+-	3.5
CD at 5 %	10.52

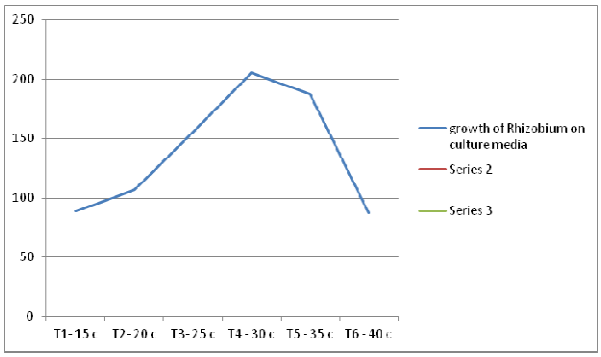

Fig. 1. Graphical representation of different temperature on growth of Rhizobium

Table 22. Effect of different medium on growth of Rhizobium

Treatment	Growth of Rhizobium on culture media
Glucose medium	128.22
Fructose medium	132.64
Sucrose medium	140.23
Starch medium	153.27
Mannitol medium	216.33
Peptone medium	187.42
SE+-	2.38
CD at 5 %	7.14

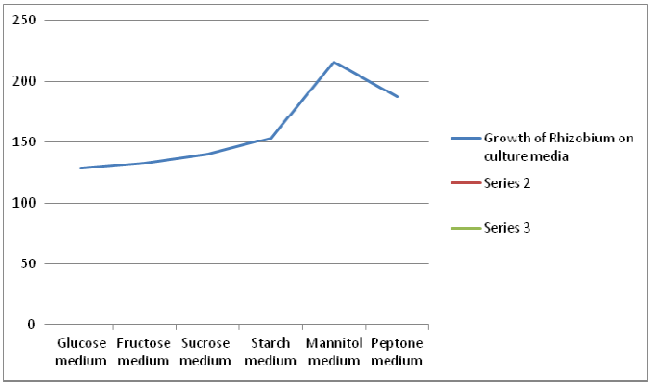

Fig. 1. Graphical representation of different medium on growth of Rhizobium

To study the effect of different carbohydrate sources, the Richard medium was used to study the growth of Rhizobium; data are tabulated in Table 22. From data it was clear that, mannitol as a source there was significantly more growth of Rhizobium compared to other sources. In glucose medium there was less biomass occurred compared to mannitol as a sources.

Summary

The isolates Rhs-1 was used for the testing the effect of temperature and carbohydrate sources. At the 30 c temperature shows the more growth of the Rhizobium, experiment were conducted on YEMA culture media and number of colony were calculated and growth of the Rhizobium were filtered on bacterial prove filter paper and biomass were measured. It shows at low temperature were less growth and at high temperature were also less growth compare to 30 c temperature. For the test of carbohydrates sources and Rhizobium strains, in which mannitol source of carbohydrates shows more growth of Rhizobium biomass. Various carbohydrates were taken as sources for growth of Rhizobium, each biomass of carbohydrates sources more filtered and biomasses were measured separately.

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