

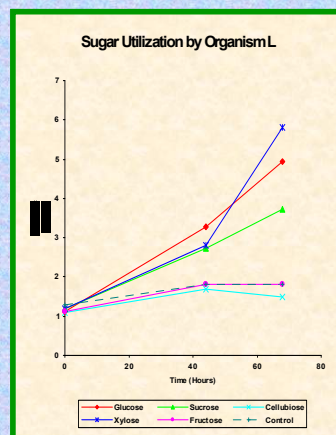
Characterization of a Novel Bacterial Strain

Introduction

Thousands of bacterial species exist which have not yet been cultured and characterized. When a bacterium is isolated it can easily be checked whether that bacterial strain has been isolated and/or named before, and which bacterial strains it is closely related to. Many novel bacteria are isolated frequently but only those strains of significant importance are named. To name a bacteria it must be characterized according to a defined protocol. The organism characterized in this research is an actinobacterium. Many closely related strains have been discovered but previously no-one has been able to culture one. Thus none have been named and so as well as naming a new strain, a new species will also be named. The organism could have importance in mining.

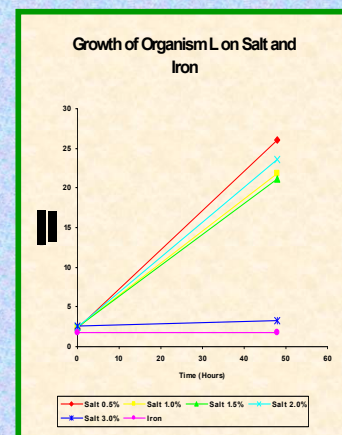
1. Sugars for Growth

Range of sugars tested to see if they could be utilized for growth by the organism. Range determined by literature review – which sugars were tested in naming of similar bacteria. Organism supplied with five different sugars and trace yeast extract in each (for essential minerals etc). Organism could grow when supplied with glucose, xylose and sucrose – but not on cellulose or fructose.



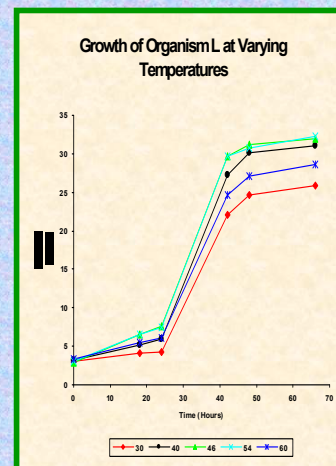
2. Iron and Salt

Some other substrates were tested for growth. It is known the organism can grow on sulfur as it was originally isolate growing on it. Tests were done for growth on iron and to try and determine the maximum salt concentration that the bacteria could tolerate. The organism could not grow on Iron and the maximum concentration of salt that can be tolerated is somewhere between 2.5 and 2.99.



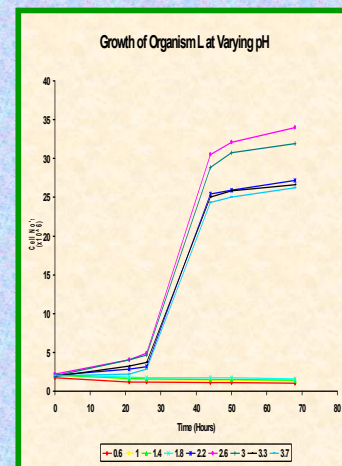
3. Temperature

Organism was grown at a range of temperatures with the aim of discovering its optimum temperature for growth and the range of temperatures over which it could grow. Established that the optimum temperature lies between 46 – 54°C. Organism capable of growth at both of the extremes at which it was tested so range could not be determined. Further experiments needed for better definition of optimum and to define range.



4. pH

Organism grown over a pH range to determine optimum pH and the pH range over which growth is possible. Optimum pH found to be between 2.3 – 2.9. The lower end of the range is somewhere between 1.81 and 1.99 (known organism grows at 2.0 from previous experiments). Higher end of the range could not be found as there was growth at 3.7. Further experiments needed to find top end of range and to better define optimum.



Conclusions and Experiences of the URSS Scheme

Although all the necessary experiments required for naming of the bacteria were completed, a few further experiments need to be carried out before naming can be achieved. Namely, further work into finding the optimum pH and temperature, and these experiments would be carried out over the narrow ranges mentioned previously. The scheme has been an invaluable experience in terms of furthering scientific skills, learning new methods and gaining an insight into how research is conducted at the highest levels. Various research skills have been learnt, including problem solving and efficient planning, and in this way the scheme has been extremely beneficial in preparation for future research as a PhD student. The prospect of undertaking research was initially daunting but the support, organisation and advice supplied by the URSS team were a great help throughout.

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