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參展科別 醫學與健康科

作品名稱 Remedies Recovered from Roof Top
Resources

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Abstract

Moss from a roof top was used to treat ear infections in my grandfather's village. This remedy sparked my curiosity and so I began researching. I was bewildered to discover that the resistance to antibiotics has been labelled as a "Catastrophic Threat" and has been ranked in the same category as terrorism and climate change. Governments globally are urging scientists to identify and produce new antibiotics and reassess novel approaches¹.

This project aims to evaluate two objectives through the use of several integrated technologies and modified methods: (a) To determine if the extracts, solutions and raw materials derived from Heart wood portion of *Picea glauca*, *Populus tremuloides*, *Salix spp*, *Betula papyrifera*, *Pinus contorta*, *Quercus alba*, *Thuja occidentalis*, *Climacium dendroides*, *Dicranum fuscescens* and *Kieselgur*, will inhibit the growth of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, and *Escherichia coli*. (b) To scientifically reassess my grandfather's traditional method of treating ear infections using roof moss.

The Heartwood portion of each tree was removed using a hammer and mallet. The Heartwood was then burnt to derive the ash and a miter saw was used to make sawdust. The moss was collected, dried and labelled. A Methanol Extraction was performed on all saw dust samples and moss using a Soxhlet Extractor for 24 hours. The ash solutions were diluted, filtered, and neutralized to pH 7. The solvents were evaporated in a Rotary evaporator and the residual material was stored in round bottom flasks. The Kirby Bauer method was modified and a Well Infusion method was devised for the biological assay. The *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, and *Escherichia coli* were plated using a 0.5 McFarland Standard. Paper filter discs containing 20uL of each extract solution and raw material were precisely placed onto the inoculated plates and incubated for 24 hours.

The preliminary results were initially unfavourable, as data could only be collected and analysed for one species; *Thuja occidentalis* (White Cedar). However, these results were extremely encouraging when the zones of inhibition were measured and analyzed. Confidence Intervals were calculated at 95% and the T-Tests were calculated at a 0.05

alpha level, which indicated significance when compared to the control. The Chi Square values were greater than the critical value of 7.8 and therefore the thorough statistical analysis indicates that the results were not due to chance alone.

Literature has indicated that certain components of trees do indeed have antibacterial properties, however there is very limited research specific to the Heartwood portion. Furthermore, I discovered that the Heartwood portion of the White Cedar tree does have certain antibacterial properties that definitely justify further testing. In addition, a combination of examining my grandfather's possessions and analyzing present data, I can confidently support my grandfather's traditional method.

In conclusion, the use of the Heartwood portion of the White Cedar to combat bacterial infection warrants further exploration. Remedies Recovered from Roof Top Resources may be the solution to this catastrophic threat.

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Present project studied the extracts of *Picea glauca*, *Populus tremuloides*, *Salix sapp*, *Betula papyrifera*, *Pinus contorta*, *Quercus alba*, *Thuja occidentalis*, *Climacium dendroides*, etc. could inhibit the growth of *staphylococcus aureus*, *Escherichia coli*, etc. It is suggested to identify the active principles of the wood extracts, for upgrading the quality of present project.