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Research in Natural Product Chemistry

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Introduction

Natural product chemistry is a branch of chemistry that deals with the isolation, identification, and study of the chemical characteristics of chemical substances produced by living organisms (Liang, & Fang, 2006). The southwestern United States has a variety of indigenous plants many of which have not been investigated for their chemical compounds but have Native American herbal uses (Moerman, 2003). The aim of this summer internship was to do extractions on plants and test them for medical potential.

Summer Objectives

• Back ground research (Literature work):
  1. Establish if other researchers have already done research on the plants of interests.
  2. Finding information on the different plant species.
  3. Extraction of compounds from plant parts.
  4. Sending plant extracts to laboratories to be tested for medical application.

Methods

Extraction:

Dry samples of plant materials were ground into powder and were extracted in a Soxhlet apparatus with hexane or dichloromethane for 4-8 hours. The solid samples were extracted 3 times using methanol. The solution was then concentrated using a rotavapor.

Extracting them for medical potential.

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Results and Conclusion

As indicated in the table at the left, one of our samples, ONU-6, has anti-TB activity. Although its MIC values (minimum inhibitory concentration) were in most cases, appreciably above those of known anti-TB compounds (RMP, INH, and PA824) used for comparisons, we kept in mind that since all of our samples (including ONU-6) are extracts, and not pure compounds, considerably lower MIC values may be obtained, if we can separate ONU-6 into its individual compounds, and then have each compound tested individually. Of course, the lower a given MIC value, the more potent it is. Also, with this in mind, one or more of the rest of our samples (with MIC values >100) could possibly have anti-TB activity if we can separate them into individual compounds.

Future Research

• Extract the rest of the plant species from Richard Spjut.
• Start the process of separating the different compounds in ONU-6 to find out which compound(s) has/have Anti-TB activity.

References

Xiao-Tian Liang, Wei-Shuo Fang (editors), Medicinal Chemistry of Bioactive Natural Products (2006), Wiley-Interscience.