

Proposal for Ph.D. Admission

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Area of Interest: Natural Product Chemistry and Organic Synthesis

Isolation and Purification of Bioactive Compounds from Natural Medicinal Plants

Introduction:

All over the world, herbal medicine is based on traditional medicine. From over all survey made in many region, traditional medicine have their own importance and basic philosophy. All over the world plenty of plant species are present. In case only 6% have been studied for their activity and very less not more than that of 20% have been investigated phytochemically. Thus, there is a needed of investigating the various bioactive compounds and the phytoanalysis and phytopharmacological evaluation of herbal drug or natural product.

The Isolated structures derived from herbal plant species can be leads to new medicinal compound or bioactive compounds.

Experimental Methods:

- In the random selection of all available plants in the area, which is collected based only on visualization and observation without having knowledge and experience about the selected plants.
- The selection is totally based on the information of the medicinal use of that particular plants. The collection based on survey and use of plants from their local area that gives prior idea about their usage and activity.
- The collected plant should be free from any contamination and collecting plants which are free from diseases (i.e. it is not affected by virus, bacteria, fungi infection).
- Drying of plant material and grinding of dried plant materials.
- The separation of medicinally active portion of plants by using extraction of non-polar to polar solvent and preparation of extracts for phytochemical analysis and their biological testing.
- Evaluation of plant extracts judged by different biological testing methods.
- Chromatographic analysis by activity guided fraction of the extract, monitoring each chromatographic fraction, its isolation calculating R_f values, and comparison with available bioactive markers which leads under investigation.
- The isolation of active molecules by chromatographic techniques likes TLC, Column chromatography.
- Highly sophisticated techniques for structure identification of bioactive molecule fractions are UV-vis, FT-IR, NMR, GC-MS and HPLC. These techniques are the heart and key challenges in research of natural drug discovery giving rise to natural products.

- Lastly, the phytochemical approach is based on the knowledge of bioactive chemical type for treating particular disease of interest should be known. The combination of various types of bioactive compound or phytochemicals is usually present in different plant extract.

Conclusion of the Study:

Separation, Identification and Characterization of bioactive compounds are a huge Challenging job in natural products. The natural bioactive compounds with minimum side effect, there are better opportunities to explore the medicinal and other biological properties of the easily inaccessible bioactive compound once the phytochemical is obtained. Further exploration through QSAR studies molecular modeling and animal studies followed by clinical trial. Natural products containing complex chemical structure, which differ according to their various species in nature. When the existing high technology methods that are available and applied, it can be leads to discovery of new drugs benefitting the whole world.

Thus, the world is always gifted with nature and man is gifted with brain.

Reference:

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- ii) www.slideshare.net/mobile/DrAmsavelvel/drugs-from-plants-extraction-purification-analysis
- iii) www.researchgate.net/publication/51131278_Natural_Products_in_Caries_Research_Current_Limited_Knowledge_Challenges_and_Future_Perspective
- iv) Carleton.ca/chemistry/current-students/graduate/research-proposals/
- v) <http://www.slideshare.net/mobile/USrinivasa/isolation-and-purification-of-natural-products-by-drsrinivasa-professor-and-head-srinivasa-college-of-pharmacy-mangalore-by-drsrinivasa>
