

HERBAL DRUG TECHNOLOGY LAB MANUAL

-As per PCI syllabus
-VI Semester B. Pharm



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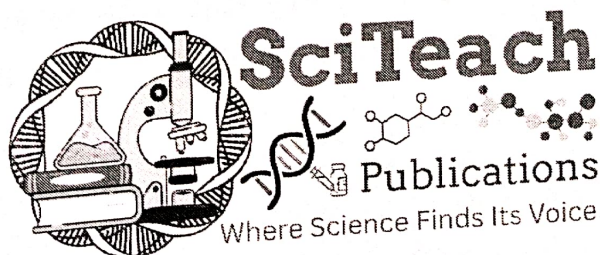
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Book Title : Herbal Drug Technology Lab Manual

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ISBN: 978-81-992774-4-1

First Edition: 2026

Published by SciTeach Publications

Email: sciteachpubs@gmail.com

Website: www.sciteachpubs.com

This book is intended for educational purposes only. The publisher and the authors have taken every effort to ensure accuracy but make no guarantees or warranties expressed or implied.

Printed in India.

Price : Rs. 130 -/

IDENTIFICATION OF PHYTOCOMPOUNDS IN THE GIVEN CRUDE EXTRACT BY PRELIMINARY PHYTOCHEMICAL SCREENING

Aim

To identify the phytoconstituents present in the herbal extract by preliminary phytochemical analysis.

Theory

Phytochemicals (from Greek *phyto*, meaning "plant") are chemicals produced by plants through primary or secondary metabolism. Phytochemicals are basically divided into two groups, viz., primary and secondary metabolites according to their functions in plant metabolism. **Primary metabolites** are organic compounds produced by living organisms that are directly involved in normal growth, physiological development and reproduction of the organism. Primary metabolites are widely distributed in nature and are needed for the survival of the organism. **Secondary metabolites** are organic compound, biosynthetically derived from primary metabolites but are more limited in distribution, usually being restricted to a taxonomic group. Primary metabolites comprises of carbohydrates, proteins and fats, while secondary metabolites comprises of alkaloids, phenolic compounds, flavonoids, tannins, glycosides, terpenoids, saponins, and so on.

Preliminary screening of phytochemicals is a valuable step, in the detection of the bioactive principles present in medicinal plants and subsequently may lead to drug discovery and development. In this experiment, the given crude extract is subjected to a series of specific chemical tests that produce characteristic color changes or precipitates in the presence of particular phytoconstituents. Each test is based on the chemical reaction between the functional groups of the phytochemicals and the added reagents. The appearance of distinct colors, froth formation, or precipitates serves as an indicator of the presence or absence of the corresponding phytocompound.

Extraction of crude drug

Extraction of medicinal plants is a process of separating active plant materials or secondary metabolites such as alkaloids, flavonoids, terpenes, saponins, steroids, and glycosides from inert or inactive material using an appropriate solvent and standard extraction procedure.

Several methods were used in the extraction of medicinal plants such as maceration, infusion, decoction, percolation, digestion, hot continuous extraction, counter current extraction, supercritical fluid extraction, ultrasound-assisted, and microwave-assisted extraction.

In general, polar solvents such as water, methanol, and ethanol are used in the extraction of polar compound, whereas nonpolar solvents such as hexane and dichloromethane are used in the extraction of nonpolar compounds. The following are 11 various solvents of extractions arranged according to the order of increasing polarity.

S. No.	Solvents	Polarity
1.	<i>n</i> -Hexane	0.009
2.	Petroleum ether	0.117
3.	Diethyl ether	0.117
4.	Ethyl acetate	0.228

PREFACE

It is our hope and expectation that this lab manual will provide an effective learning experience and referenced resource for the VI semester B. Pharm students studying Pharmacy in accordance with the syllabus of Pharmacy Council of India. This book is written in a simple, comprehensive and illustrative language for proper understanding of the subject. The manual is designed to provide students with hands-on experience in various laboratory techniques related to herbal drug technology, including extraction, phytochemical evaluation, quality control, and formulation aspects of herbal drugs.

This manual will serve as a practical guide for students to correlate theoretical concepts with laboratory work and to enhance their competence in the field of herbal drug technology. We hope that this laboratory manual will help students gain confidence and foster scientific curiosity, enabling them to meet the professional challenges of the pharmaceutical and herbal industry. The manual will be useful for the students to get a sure success in the examinations.

Although every effort has been made to keep this book error free, in spite of this, some typographical errors might have crept in. If you notice any such mistake, error or discrepancy, we would be extremely thankful if the same are brought to our notice. We sincerely hope that all the Pharmacognosy faculties and UG students will certainly welcome the book.



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Printed in India.

ISBN: 978-81-992774-4-1

