

B.Sc 3rd Year Botany Major (6th Semester)

Paper 604: UNIT V: Pharmacognosy: Pharmacognosy and its importance in medicinal plant uses

Pharmacognosy involves the identification, physicochemical characterization, cultivation, extraction, preparation, quality control, and biological assessment of drugs. A plant leaf, flower, root, animal or plant extract may be used to isolate the bioactive chemical.

Any plant preparation used for health purposes rather than simply for nutritional supplementation or to add flavor to food is called a medicinal preparation. Some examples of such compounds include caffeine, salicylic acid, and some chemotherapeutic, inotropic, and anti-gout agents.

The term "Pharmacognosy" was coined by Seydler, a German botanist, from the two Greek words "pharmakon", meaning drug or medicine, and "gnosis", meaning knowledge. Even today, about a quarter of all prescription drugs in the US have one or more bioactive compounds derived from plants.

Pharmacognosy in drug development

According to the American Society of Pharmacognosy, the definition of pharmacognosy is "the study of the physical, chemical, biochemical, and biological properties of drugs, drug substances or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources".

Pharmacognosy is used by pharmaceutical companies to screen, characterize and produce new drugs for the treatment of human disease. Often, naturally occurring drugs cannot be mass produced, so they must be studied in order to develop synthetic biosimilars. Producing these compounds synthetically allows modifications to be made such as increases in bioavailability, altered pharmacokinetics and increased efficacy. These modifications can transform a

crude inactive plant extract into a powerful drug, as observed in some anticancer drugs. Thus, natural compounds could provide excellent models to produce novel drugs.

Pharmacognosy includes botanical knowledge to classify and name the plant; understand its genetic pattern and its cultivation; chemical knowledge to isolate, identify, and quantitatively assess the bioactive compounds in the plant sources; and pharmacology to detect and evaluate their biological properties and effects on living systems. It also needs a working knowledge of quality control to ensure correct identification and purity of the drug as well as accurate testing of its efficacy and safety.

Importance of pharmacognosy:

Traditionally, pharmacognosy was recognized as a vital part of drug development processes and pharmacy education, but began to be neglected with the advent of new miracle drugs that can be synthesized in the laboratory. However, many scientists are now recognizing that indigenous knowledge about the medicinal virtue of many plants should never be lost as it offers great insight into the development of new drugs. For example, artemisinin from the *Artemisia annua* or *ginghaosu tree*, which is recognized as an ancient Chinese drug for malaria. The respect for ancient wisdom is reflected in the form of phytotherapy and phytopharmaceuticals. The use of plant products to treat illness is well known in South American nations, China, and India where billions of dollars are spent on pharmacognosy research to identify and market natural medicinal drugs. The importance of medicinal plants should also be studied in other countries in order to fight currently untreatable, life-threatening diseases such as Alzheimer's, HIV, chronic pain, and malaria. Several natural drugs are under investigation in clinical trials, at present.

Sources:

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204033/>
- <http://www.pharmacognosy.com/about.htm>