



Advanced Herbal Technology

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ABSTRACT

Recently peoples are getting attracted towards herbal medicines due to many advantages. Herbal formulations have reached extensive acceptability as therapeutic agents for several diseases. Although, most of these applications are unorthodox, it is however a known fact that over 80% of the world population depends on herbal medicines and product for healthy living. This rise in the use of herbal product has also given rise to various forms of abuse and adulteration of the products leading to consumers' and manufacturers' disappointment and in some instances fatal consequences. The development of authentic analytical methods which can reliably profile the phytochemical composition, including quantitative analyses of marker/bioactive compounds and other major constituents, is a major challenge to scientists. Standardization is an important step for the establishment of a consistent biological activity, a consistent chemical profile or simply a quality assurance program for production and manufacturing of herbal Key Words Objective drugs. In present review article various convectional methods as well as newer advances are described. Recent advancements includes DNA fingerprinting, metabolomics technique, differential pulse polarography, chemometric, X-ray diffraction....etc are observed. Capillary electrophoresis and chromatographic techniques contributions towards standardization of herbal drugs is also reported.

OBJECTIVE

1. Know about the present scope and future prospects of herbal drug industry.
2. Know about the components of GMP and various infrastructural requirement of working space.

INTRODUCTION

The use of herbs as medicine is the oldest form of healthcare know to humanity and has been used in all culture through out history .Herbal drug have been used since times as medicine for treatment of a range of diseases medicinal plant have play a key role in world health. In spite of the great advance observed in modern medicine recent decades plants still make an important contribution to healthcare. Medicine is a substance that has nutritive, curative, or preventive properties, while the term "herbal" refers to a botanical or plant - based preparation. The term "herbal medicine" is used for plant- based substances that consist of nutritive, curative, or preventive properties. Herbal medicine is an interdisciplinary branch between herbal medicine and Ayurveda as it covers all fields of herbal medicine related to botany, medicinal pl ant research, pharmacognosy, phytochemistry, phytotherapy, botanical medicines, Ayurveda, natural chemistry, agriculture science, Unani medicine, biotechnology, and biochemistry .A person who deals with herbs, especially medicinal herbs, is known as an Herbalist .Herbal journals deal with the use of plants in the treatment of diseases.

➤ Herbal Plant

1. Crucuma longa
2. Orange peel
3. Peppermint
4. Turmeric
5. Tea tree oil

HISTORY

Today modern drug discovery utilizes several advanced techniques like MST technology which is used to measure molecular interactions. But drug discovery method weren't always so sophisticated a few hundred year ago medicine were there are derived from plant these substance add know therapeutic properties that were discovered by trail and error and propagated by word by mouth but very little was known about why each performed the way it did.

DIFFERENT METHOD OF IDENTIFICATION OF PLANT

➤ Expert Determination:

The best method of identification is expert determination in terms of reliability or accuracy it process in which difference between parties, to one expert make determination of the mater referred to it. expert determination rules can only take place if both parties insert an expert determination relevant contract.. In general the experts have prepared treatments (monographs, revisions, synopses) of the group in question, and it is probable that the more recent floras or manuals include the expert's concepts of taxa. Experts are typically found in botanical gardens, herbaria, museums, colleges, universities, etc...

➤ Recognition:

It approaches expert determination in reliability. This is based on extensive, past experience of the identifier with the plant group in .in some groups this is virtually impossible. Comparison- A third method is by comparison of an unknown with named specimens, photographs, illustrations or descriptions. Although this is a reliable method, it may be very time consuming or virtually impossible due to the lack of suitable materials for comparison. The Use of Keys and Similar Devices Synopses, Outlines, etc. This is by far the most widely used method and does not require the time, materials, or experience involved in comparison and recognition.

ISOLATION AND TECHNIQUES

✓ Extraction method

Plant material extraction is a crucial process in the isolation of natural plant compounds and their purification. Plant matrices naturally are complex, containing a wide range of compounds that have various physical and chemical properties. It is therefore imperative to carefully, isolate from the rest of the plant, matrices and make pure, compounds of interest in plants for their characterization. There are several ways extraction methods can be categorized In this chapter, they have been categorized based on the temperatures they work under. 1 Low or room Temperature methods. Cold extraction method. The method has been described in literature Briefly, dried plant parts samples (Cut, crushed or milled).

Isolation is the division of trained individual from the non-contaminated individual for the time of coherence under conditions which will forestall the transmission of disease to other people. Isolation strategy implies seeing that multitude of practices that are intended to keep the transmission of explicit microorganism starting with one individual then onto the next straightforwardly or by implication. It is likewise called obstruction nursing procedure. Isolation is the partition of the patient and his unit from others to forestall the immediate or backhanded contact of irresistible specialist to vulnerable individual.

An extraction solvent must readily dissolve the substance to be extracted, yet it must be soluble in the solvent from which the desired substance is to be extracted. Also, it should extract only the desired substance or as small an amount as possible of any other substance present.

It should not react chemically with the solute in an undesirable way, and it should be easily separated from the desired solute after extraction.

✓ CHROMATOGRAPHIC TECHNIQUE

The first true chromatography is usually attributed to the Russian-Italian botanist Mikhail. Tsvet applied his observations with filter paper extraction to the new methods of column fractionation that had been developed in the 1890s for separating the components of petroleum. He used a liquid-adsorption column containing calcium carbonate to separate yellow, orange, and green plant pigments (what are known today as xanthophylls, carotenes, and chlorophylls, respectively). is a separation technique that uses the size, shape, chemical properties or charge of molecules in a sample to separate the sample into its constituent components. It is often used to detect one, or a number of, components in a complex mixture. People on all continents have used hundreds to thousands of indigenous plants for treatment of ailments since prehistoric times. Many plants synthesize substances that are useful to the maintenance of health in humans and other animals.

These include aromatic substances, most of which are phenols or their oxygen substituted derivatives such as tannins Sick animal tend to forage plants rich in secondary metabolites, such as tannins and alkaloids. Since these phytochemicals often have antiviral, antibacterial, antifungal and anthelmintic properties, a plausible case can be made for self-medication by animals in the wild.

PURIFICATION TECHNIQUE FOR ISOLATED PHYTOCONSTITUENTS

1. Solvent Extraction or Liquid-liquid extraction

It is a method to separate compounds based on their relative solubilities in two different immiscible liquids, usually water and an organic solvent. Compounds with different solubility dissolve in a different solvent.

2. Filtration

Filtration is commonly the mechanical or physical operation which is used for the separation of solids from fluids (liquids or gases) by interposing a medium through which only the fluid can pass.

3. Crystallization

The method of purification of solids in which they are dissolved in proper solvent till saturation point after which they are filtered hot to obtain pure crystal of solid is called as crystallization.

3. Fractional crystallization: is a way to separate soluble solids by using the characteristic property of their solubility in an appropriate solvent. It is based on the fact that temperature affects solubility differently for different substances.

4. Distillation: Process involving the conversion of a liquid into vapour that is subsequently condensed back to liquid form.e.g. extraction of pure water form salt water, extraction of gasoline from crude oil, etc.

5. Precipitation: It is any liquid or frozen water that forms in the atmosphere and falls back to the Earth. It comes in many forms, like rain, sleet, and snow. Along with evaporation and condensation, precipitation is one of the three major parts of the global water cycle.

6. Salting Out: is a purification technique that utilizes the reduced solubility of certain molecules in a solution of very high ionic strength. Salting out is typically used to precipitate large biomolecules, such as proteins or DNA.

7. Dialysis: is a treatment for individuals whose kidneys are failing. There are two types of dialysis and peritoneal dialysis, that both perform normal kidney functions, filtering waste and excess fluid from the blood .Dialysis is a treatment for people whose kidneys are failing. When you have kidney failure, your kidneys don't filter blood the way they should. As a result, wastes and toxins build up in your bloodstream. Dialysis does the work of your kidneys, removing waste products and excess fluid from the blood.

WHO GUIDELINES FOR QUALITY STANDERIZED HERBAL FORMULATIONS:

The subject of herbal drug Standardization is massively wide and deep. the guidelines set by

WHO can be summarized as follows:

- Reference to the identity of drug
- Reference to the Physicochemical character of the drug.
- Reference to the pharmacological parameters.
- Microbiological parameters • Radioactive Contamination.

1. Reference to the identity of drug:

Botanical Evaluation : Botanical identity like phytomorphology , microscopical and histological analysis, sensory characters, foreign organic matter , histochemical evaluation etc.

2. Reference to the pharmacological properties:

Biological activity profile, bitterness value, haemolytic index, astringency, swelling factor, foaming index etc.

3. Toxicity Details:

Pesticide residue, heavy metals, microbial contamination like total viable count, pathogens like E .Coli, Salmonella S..aurea.

4. Microbiological parameter:

It include total viable count ,total mold count ,total entero-bacterial count. Limiters can be utilized as Quatitative or semiquantitative tool to as certain and control the amount of impurities like the reagents used during abstraction of various herbs, impurities coming directly from the manufacturing vessels and from the solvent.

CONCLUSION

This subject is focused on mainly Herbal Extraction Techniques. Plants, herbs, and ethnobotanicals have been used since the early days of humankind and are still used throughout the world for health promotion and treatment of disease. Plants and natural sources form the basis of today's modern medicine and contribute largely to the commercial drug preparations manufactured today. About 25% of drugs prescribed worldwide are derived from plants. Still, herbs, rather than drugs, are often used in health care. For some, herbal medicine is their preferred method of treatment. For others, herbs are used as adjunct therapy to conventional pharmaceuticals. However, in many developing societies, traditional medicine of which herbal medicine is a core part is the only system of health care available or affordable. Regardless of the reason, those using herbal medicines should be assured that the products they are buying are safe and contain what they are supposed to, whether this is a particular herb or a particular amount of a specific herbal component. for the good end product various extraction process like TLC, HPLC, and Coloumn Chromatography. Consumers should also be given science-based information on dosage, contraindications, and efficacy. To achieve this, global harmonization of legislation is needed to guide the responsible production and

marketing of herbal medicines. If sufficient scientific evidence of benefit is available for an herb, then such legislation should allow for this to be used appropriately to promote the use of that herb so that these benefits can be realized for the promotion of public health and treatment of disease

REFERENCE

1. P. Tonthubthimthong, S. Chuaprasert, P. Douglas and W. Luewisutthichat. (2011, March). Supercritical CO₂ extraction of nimbin from neem seeds an experimental study, *Journal of Food Engineering*. 47 (4), pp. 289-293.
2. V. Duraipandiyam, M. Ayyanarand S. Ignacimuthu. (2006, October). Antimicrobial activity of some ethnomedicinal plants used by Paliyar tribe from Tamil Nadu, India. *BMC Complementary Altern. Med.* 6 (35), pp. 35-413. J.J. Roy Burman, "Tribal Medicine" 1sted. A Mittal Publication, 2003, New Delhi, pp. 12
3. JX Li and ZY. Yu (2006). Cemicifugaerhizoma: from origins, bioactive constituents to clinical outcomes, *Curr Med Chem*. 13 (27), pp 2927-51.
4. JF. Liao, Y.M Jan, SY. Huang, HH. Wang, LL. Yu and CF. Chen. (1995, July). Evaluation with receptor binding assay on the water extracts of ten CNS-active Chinese herbal drugs, *Proceedings of the National science Council, Republic of China*. 19 (3), pp. 151-158.
5. A. Ahmad, A.F.M. Alkarkhi, S. Henaand L.H. Lima. (2009, February). Extraction, Separation and Identification of Chemical Ingredients of *Elephantopus Scaber L* Using Factorial Design of Experiment, *International Journal of Chemistry*. 1(1), pp. 36-49.
6. Christian Reichardt, *Solvents and Solvent Effects in Organic Chemistry*, (3rd ed.). Wiley VCH Publishers, 2003
7. Freed BK, Biesecker J, Middleton WJ, Spectral polarity index: a new method for determining the relative polarity of solvents. *Journal of Fluorine Chemistry* 48(1), 63-75, 1990.
8. Baron, J. & D. Spulber (2015): *Technology Standards and Standards Organizations: Introduction to the Searle Center Database*, 2015/9/8.
9. Baron, J.; Pohlmann, T. & K. Blind (2016): *Essential patents and standard dynamics*, forthcoming in: *Research Policy*.
10. Bekkers, R.; Bongard, R. & A. Nuvolari (2011): *An empirical study on the determinants of essential patent claims in compatibility standards*. *Research Policy*, 40(7), 1001-1015.
11. Sagar Bhanu, P.S., Zafar R., Panwar R. (2005). *Herbal drug standardization*. *The Indian Pharmacist*, 4(35): 19-22.
12. Patel, P.M., Patel N.M., Goyal, R.K. (2006). *Evaluation of marketed polyherbal antidiabetic formulations uses biomarker charantin*. *The Pharma Review*, 4(22): 113.
13. Patel, P.M., Patel, N.M., Goyal, R.K. (2006). *Quality control of herbal products*. *The Indian Pharmacist*, 5 (45): 26-30.
14. Bhutani, K.K. (2003). *Herbal medicines an enigma and challenge to science and directions for new initiatives*. *Indian Journal of Natural Products*, 19 (1):3-8.
15. Kokate, C.K., Purohit, A.P., Gokhale, S.B. Feb. (2005). *Analytical Pharmacognosy*.
16. Pattanaya P, Jena RK, Panda SK. *HPTLC fingerprinting in The standardization of sulaharan yoga: An ayurvedic tablet Formulation*. *Int J Pharm Sci Rev Res* 2010page no 709
17. Kalpana J, Preeti C, Dnyaneshwar W, Bhushan P. *Molecular Markers in herbal drug technology*. *Cur Sci* 2004 page no 123
18. *Pharmacovigilance of herbal medicines: Current state and Future directions*: London, UK, 26-28 April, 2006. *Drug Safety*: 2006 page no 516
19. *Quality Control Methods for Medicinal Plant Materials*, WHO, Geneva, 1996page no 505.
20. Bhutani KK. *Herbal medicines enigma and a challenge for Science and guidelines for new initiatives*. *J Nat Prod* 2003 page no 412