International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Recent Advances in Traditional Drug Technology

V. Rajamanickam[1], M. Surendra Kumar[2], M. Kavin Kumar[3], K. Swetha[4], V. Devaganapathy[5], S. Nishanth[6], M. Balaji[7]

[1, 2]Department of Pharmacognosy, Senghundhar College of Pharmacy, Kumaramangalam, Namakal District, Tamil Nadu, India- 637205

[3, 4 5, 6, 7]Senghundhar College of Pharmacy, Kumaramangalam, Namakal District, Tamil Nadu, India- 637205

Abstract: ***In recent years more people around the world are focusing to use herbal products in the medicinal system. The worldwide required for traditional medicine has resulted in the growth of natural product markets and interest in alternative system of medicine. Medicinal plant is used for changing natural product into medicines with standardization and quality. Herbal remedies show up an important ingredient in traditional system of medicine. Herbal medicines have been used time immemorial to healthy living and for varies disease ailment. In challenging with phytopharmaceutical marketing significant usage for natural remedies. This review emphasis a common idea of traditional medicines and used to explain the pharmacological effectiveness of various traditional medicines, adverse drug reactions, drug interactions, standardization and stability testing of natural products, pharmacovigilance and regulatory status of herbal drugs.***

Keywords: Herbal drug technology**,** Drug interaction, Limitations, Stability, Pharmacovigilance.

1. Introduction

Herbal drugs referred as plants materials or herbalism, involves the use of whole plants or parts of plants, to treat injuries or illnesses[1].Herbal drugs are use of therapeutic herbs to prevent and treat diseases and ailments or to support health and healing[2].These are drugs or preparation made from a plant or plants and used for any of such purposes. Herbal drugs are the oldest form of health care known to mankind[3].There are many herbal products offered that assert to treat the symptoms of a broad range of problems, from depression to cold and flu. World Health Organization[4] (WHO) has distinct herbal drugs as complete, labeled medicinal products that have vigorous ingredients, aerial or secretive parts of the plant or other plant material or combinations. World Health Organization has set precise guidelines for the evaluation of the safety, efficacy, and quality of herbal medicines. WHO estimates that 80% of the world populations currently use herbal drugs for major health care. Exceptionally, in some countries herbal drugs may also enclose by tradition, natural organic or inorganic active constituents which are not of plant source. Herbal drug is a chief constituent in traditional medicine and a common constituent in ayurvedic, homeopathic, naturopathic and other medicine systems[5]. Herbs are usually considered as safe since they belong to natural sources[6]. The use of herbal drugs due to toxicity and side effects of allopathic medicines, has led to rapid increase in the number of herbal drug manufacturers. For the past few decades, herbal drugs have been more and more consumed by the people with no prescription. Seeds, leaves, stems, bark, roots, flowers, and extracts of all of these have been used in herbal drugs over the millennia of their use. Herbal products have reached extensive adequacy as beneficial agents like antimicrobial, antidiabetic, antifertility, antiageing, antiarthritic, sedative, antidepressant, antianxiety, antispasmodic, analgesic, anti-inflammatory, anti-HIV, vasodilatory, hepatoprotective, treatment of cirrhosis, asthma, acne, impotence, menopause, migraine, gall stones, chronic fatigue, Alzheimer's disease and memory enhancing activities[7]. Herbal drugs have been recognized for approximately 4000 years. These drugs have survived real world testing and thousands of years of human testing. Some drugs have been discontinued due to their toxicity, while others have been modified or combined with additional herbs to counterbalance side effects.

Advantages of Herbal Drugs

1) Low/Minimum cost
2) Potency and efficiency
3) Enhanced tolerance
4) More protection
5) Fewer side-effects
6) Complete accessibility
7) Recyclable

Disadvantages of Herbal Drugs

1) Not able to cure rapid sickness and accidents
2) Risk with self dosing
3) Complexity in standardizations

Usage and Preparation of Herbal Drugs

The use of herbal drugs in the correct way provides effectual and safe treatment for many ailments. The efficiency of the herbal drugs is typically subjective to the patient[8]. The strength of the herbal drugs varies based on the genetic distinction, growing conditions, timing and method of harvesting, revelation of the herbs to air, light and dampness, and type of conservation of the herbs. Some of the plants that make up herbal drugs are cultured and processed in the country and others are imported from around the world. Raw materials for herbal drugs may be derived from carefully cultivated plants or collected in the wild[9].

Herbal drugs are accessible in several forms and often require preparation before their use. They can be normally purchased

in mass form as dried plants, plant parts or insecurely packed for herbal teas and decoctions. Decoctions are made by boiling the herb in water, then straining out of the plant material. More intense forms of herbal drugs are available in the form of hydro alcoholic tinctures and fluid extracts. Methods of preparation may differ because of the nature of the plants active chemical constituents[10].

Herbal - Drug Interactions

Herbs are often administered in combination with therapeutic drugs, raising the potential for herb-drug interactions. Cases have been published reporting enhanced anticoagulation and bleeding when patients on long-term warfarin therapy also took *Salvia miltiorrhiza* (danshen). *Allium sativum* (garlic) decreased the area under the plasma concentration-time curve (AUC) and maximum plasma concentration of saquinavir, but not ritonavir and paracetamol (acetaminophen), in volunteers. A. sativum increased the clotting time and international normalised ratio of warfarin and caused hypoglycemia when taken with chlorpropamide. *Ginkgo biloba* (ginkgo) caused bleeding when combined with warfarin or aspirin (acetylsalicylic acid) raised blood pressure when combined with a thiazide diuretic and even caused coma when combined with trazodone in patients. Mitantly with phenelzine, but ginseng increased the efficacy of influenza vaccination. *Scutellariabaicalensis*(huangqin) ameliorated irinotecan-induced gastrointestinal toxicity in cancer patients. *Piper methysticum* (kava) increased the 'off' periods in patients with parkinsonism taking levodopa and induced a semicomatose state when given concomitantly with alprazolam. Kava enhanced the hypnotic effect of alcohol in mice, but this was not observed in humans. *Silybummarianum* (milk thistle) decreased the trough concentrations of indinavir in humans. Piperine from black *(Piper nigrum*Linn) and long (*P. longum* Linn) peppers increased the AUC of phenytoin, propranolol andtheophylline in healthy volunteers and plasma concentrations of rifamipicin (rifampin) in patients with pulmonary tuberculosis. Interactions between herbal medicines and prescribed drugs can occur and may lead to serious clinical consequences. There are other theoretical interactions indicated by preclinical data. Both pharmacokinetic and/or pharmacodynamic mechanisms have been considered to play a role in these interactions, although the underlying mechanisms for the altered drug effects and/or concentrations by concomitant herbal medicines are yet to be determined. The clinical importance of herb-drug interactions depends on many factors associated with the particular herb, drug, and patient. Herbs should be appropriately labeled to alert consumers to potential interactions when concomitantly used with drugs, and to recommend a consultation with their general practitioners[11].

Stability testing of Herbal Drugs

Stability testing of herbal drugs is a challenging risk, because the entire herb or herbal product is regarded as the active matter, regardless of whether constituents with defined therapeutic activity are known[12]. The purpose of a stability testing is provide proof on how the quality of the herbal products varies with the time under the influence of environmental factors such as temperature, light, oxygen, moisture, other ingredient or excipients in the dosage form, particle size of drug, microbial contamination, trace metal contamination, leaching from the container and to establish a recommended storage condition and shelf-life. Stability testing is necessary to ensure that the product is of satisfactory quality throughout its entire storage period. Stability studies should be performed on at least three production batches of the herbal products for the proposed shelf-life, which is normally denoted as long term stability studies performed under natural atmosperic conditions. Stability data can also be generated under accelerated atmospheric conditions of temperature, humidity and light, which is referred to as short term stability and the data so obtained is used for predicting shelf-life of the product. Stability testing should be conducted on the dosage form packaged in the container closure system proposed for marketing. With the help of modern analytical techniques like spectrophotometry, HPLC, HPTLC and by employing proper guidelines it is possible to generate a sound stability data of herbal products and predict their shelf-life, which will help in improving global acceptability of herbal products[13].

Pharmacovigilance of Herbal Drug

Pharmacovigilance is relating to detection, assessment, understanding and prevention of adverse effects particularly long term and short term effect of medicines. In other words, it is collecting, monitoring, researching, assessing and evaluating information from healthcare providers and patients on the adverse effects of medications. It is also the study of marketed drugs under practical conditions of clinical usages. Information on adverse drug reactions can be generated from spontaneous reports or normal clinical trials. Systematic pharmacovigilance is essential to building up reliable information on the safety of herbal medicines for the development of appropriate guidelines for safe effective use. It is to improve patient care and safety in relation to the use of medicines and all the medical and paramedical interventions, to improve public health and safety in relation to the use of medicines[14].

The WHO has welcomed the active participation of drug regulatory authorities and national pharmacovigilance centers, among others, in the development of these guidelines. This has provided a useful starting point for strengthening communication between these authorities, which will be needed to ensure progress toward the common goal-the safety of herbal medicines[15]. The guidelines, therefore, identify the particular challenges posed in monitoring the safety of herbal medicines effectively and propose approaches for overcoming them. Special attention is also given to the reporting system for adverse reactions to herbal medicines, and to the analysis of the causes of the reported adverse reactions[16].The safety monitoring of herbal medicines is compared and contrasted with that of other medicines currently undertaken in the context of the WHO International Drug Monitoring Program. Although there are regulatory and cultural differences in the preparation and use of different types of medicines, they are all equally important from a pharmacovigilance perspective. The inclusion of herbal medicines in pharmacovigilance

systems is becoming increasingly important given the growing use of herbal products and herbal medicines globally. Herbal medicines are frequently used in conjunction used in conjunction with other medicines, and it is essential to understand the consequences of such combined use and monitor whether any adverse effects are arising. This can be achieved most readily within the existing pharmacovigilance systems. To handle herbal medicines and, in particular, to analyze the causes of adverse events, the national pharmacovigilance centers (or equivalent institutions) will need to acquire specific technical expertise. This will include trained personnel in the relevant technical areas and facilities to analyze the products concerned, for which there is often insufficient information and lack of access to reliable information support. Many countries currently lack this expertise and, in particular, access to suitable analytic laboratories. The Member States have therefore recommended the establishment of regional laboratories specializing in the analysis of herbal products. The WHO encourages the Member States to explore the feasibility of this proposal.

Regulatory Status of Herbal Drugs

The lawful situation of herbal drugs varies from country to country. Developing countries have folk knowledge of herbs and their use in traditional medicine is wide spread. But, these countries do not have any lawmaking criteria to include these traditionally used herbal drugs in drug legislation[17]. Endorsement of herbal drugs in most countries is based on traditional herbal references, provided they are not known to be unsafe when used to treat slight illnesses. But, now-a-days claims are being made to treat more serious illnesses with herbal drugs for which no traditional knowledge is present[18]. Therefore, narrow requirements for herbal drugs are necessary to ensure the safety Regulatory Status of Herbal Drugs The lawful situation of herbal drugs varies from country to country. Developing countries have folk knowledge of herbs and their use in traditional medicine is wide spread. But, these countries do not have any lawmaking criteria to include these traditionally used herbal drugs in drug legislation. Endorsement of herbal drugs in most countries is based on traditional herbal references, provided they are not known to be unsafe when used to treat slight illnesses. But, now-a-days claims are being made to treat more serious illnesses with herbal drugs for which no traditional knowledge is present. Therefore, narrow requirements for herbal drugs are necessary to ensure the safety[19].

Pharmacological Actions of Herbal Drugs Anti-inflammatory activity

The extracts of *Achilleamillefolium, Artemisia vulgaris, Bauhinia tarapotensis, Curcuma longa, Forsythia suspense, Houttuyniacordata, Glycyrrhizauralensis, Lonicera japonica, Rutagraveolens, Securidacalongipedunculata and Valerianawallichii* have shown anti-inflammatory activity[10].

Analgesic activity

The extracts of *Bougainvillaspectabilis, Chelidoniummajus, Ficusglomerata, Dalbergialanceolaria, Glauciumgrandiflorum, Glauciumpaucilobum, Nepeta italic, Polyalthialongifolia, Sidaacuta, Stylosanthesfruticosa, Toona ciliate, Zatariamultiflora and Zingiberzerumbet* are used as analgesic agents[20].

Antifertility activity

Plant drugs have involved in the concentration of many scientists as a primary source of naturally occurring fertility regulating agents because of their little or no side effects. The plants that have been reported to have antifertility activity are *Amaranthusretroflexus, Artabotrysodoratissimus, Barberis vulgaris, Carica papaya, Dieffenbachia seguine, Evodiarutacapra, Fatsia horrid, Ferula assafoetida, Hibiscus rosasinensis, Loniceraciliosa, , Magnolia virginiana, Mardeniacundurango, Pisumsativum, Podophyllumpeltatum, Punicagranatum, Raphanussativus, Rehmanniaglutinosa, Semecarpusanacardium, Sesbaniasesban, Stemona japonica, Thujaoccidentalis, Taxusbaccata and Verbena officinalis*[21].

Antipsoriasis activity

A variety of natural proprietary formulas and preparations containing plant materials have been used to provide symptomatic relief in psoriasis. The different herbal remedies for psoriasis are, turmeric, curcumin, shark cartilage extract, oregano oil, milk thistle. Various antimicrobial agents *Azadirachtaindica, Calendula officinalis, Cassia tora, Wrightiatinctoria* have been used in the management of psoriasi[22,23].

Antidipressive activity

A number of nutritional and herbal supplements have shown promise as alternative treatments for depression. A large number of plants have potential functions to treat depression which are described as, *Bacopamonniera, Panaxquinquefolius, Piper methysticum, Rhodiolarosea, Valerianaofficinalis and Hypericum perforatum*[24].

Antiageing activity

Cell membranes are particularly susceptible to the hostility of free radicals. When the nucleus is injured, the cell loses its ability to replicate itself. The impaired cell replication results in the destabilized immune system, skin ageing and many age related disorders. Various antioxidants neutralize the free radicals and prevent oxidation on a cellular level. The most effectual antioxidants include pine bark extract, grape seed extract, and blue berries were effectual against the hostility of free radicals. Some commonly used herbs as antiageing agents are *Allium sativum, Arnica montana, Cucumissativum, Curcuma longa, Ficusbengalenis, Lyciumbarbarum, Ocimumsanctum,Panax ginseng, Prunusamygdalus, Santalum album, Rosa damascene and Withania somnifera*[25,26].

2. Conclusion

Medicinal herbs as potential source of therapeutics aids has attained a significant role in healthcare of plants, to treat injuries or illness system all over the world for human beings not only in the diseased condition but also as potential material for maintaining proper health[27]. It is clear that the herbal industry can make great strides in the world. With the

increased use of herbal products, the future worldwide labeling practice should adequately address quality aspects. Standardization of methods and quality control data on safety and efficacy are required for understanding of the use of herbal drugs. A major factor impeding the development of the medicinal plant based industries in developing countries has been the lack of information on the social and economic benefits that could be derived from the industrial utilization of medicinal plants. Further research is required to exploit the compounds responsible for the observed biological activity[28].

References

[1] Winslow, L; Kroll, DJ "Herbs as Medicines, Archives of Internal Medicine", 1998; 158: 2192-2199.
[2] Gossell, M; Simon, OR; West, ME "The past and the present use of plants for medicines", West Indian Medical Journal, 2006; 55: 217.
[3] De-Smet, PGAM. "The role of plant derived drugs and herbal medicines in healthcare drugs, 1997; 54:801-840.
[4] WHO technical report series "Guidelines for the Assessment of Herbal Medicines", 1996; 863: 178-184.
[5] Abhishek, K; Ashutosh, M and Sinha, BN. "Herbal drugs- present status and efforts to promote and regulate cultivation" 2006; 6:73-77.
[6] Harish, P. "Herbal drugs", Current Science, 2001; 81(1): 15.
[7] Coleman, LM and Fowler, LL and Williams ME, Journal of the American Geriatrics Society, 1995; 43: 747-750.
[8] Sutherland,LR and Verhoef, MJ "Why do patients seek a second opinion or alternative medicine", Clinical Gastroenterology", 1994; 19: 194-197.
[9] Catherine, C; Crone, MD; Thomas, N and Wise, MD "Use of herbal medicines among consultationliaison populations", The Academy of Psychosomatic Medicine", 1998; 39(1): 3-13.
[10] The Indian Pharmacopoeia, Govt. of India, Ministry of Health and Family Welfare, The Controller of Publication, 1996; A-53, 54, 89
[11] Hu Z, Yang X, Ho PC, Chan SY, Heng PW, Chan E, Duan W, Koh HL, Zhou S Herb-drug interactions: a literature review. Drugs. 2005;65(9):1239-82
[12] Thakur, AK; Prasad, NAV and Ladha, KS (2008), "Stability testing of herbal products", The Pharma Review, 4, 109-112.
[13] Kathrin, K; Eike, R and Anne, B (2003),"Validation of standardized high performance thin layer chromatographic methods for quality and stability testing of medicine s", Journal of AOAC International, 86(5), 909-915
[14] S.L Deore, S.S.Khadabadi, B.A. Baviskar, ―Pharmacognosy and PhytochemistryA comprehensive approach. Pharma med press. 2003;670-1.
[15] Safety monitoring of medicinal products: guidelines for setting up and running a pharmacovigilancecentre. Uppsala, Uppsala Monitoring Centre, 2000 (reproduced in Part II of this publication)
[16] US report calls for tighter controls on complementary medicine. Br Med J. 2002; 324:87
[17] Sukhdev, S; Arun, N and Kalia, AN (2008),"Patentability of herbal products: A review", The Pharma Review, 4,118-124.
[18] Raskin, L et al. (2002), "Plants and human health in the twenty first century", Trends in Biotechnology, 20 (12), 522-531.
[19] Calixto, JB (2000), "Efficacy, safety, quality control, marketing, and regulatory guidelines for herbal medicines", Brazilian Journal of Medical and Biological Research, 33,179-189.
[20] Sehgal, A (2003), "Herbal medicinesharmless or harmful", Anesthesia; 57,947-948.
[21] Nandakishore, D; Shubhangi, G; Prakash, I;Pallavi, S; Parimal, K and Shishupal, B(2007), "Herbal plants with antifertility activity", The PharmaReview, 8, 131-135.
[22] Raman, D., Sabitha, JS and Shivanand, BG(2005), "Anti-microbial activity of herbs used in psoriasis" The Pharma Review, 8,71-72.
[23] Ben, E; Ziv, M and Frenkel, M (2004),"Complementary medicine and psoriasis: linking the patient‟s outlook with evidence based medicine".
[24] Jeyaprakash, K (2007), "Herbal therapy for depression", Herbal Tech Industry, 3(7),19-25.
[25] Khan, I; Alam, S; Akhter, S; Shahin, N andAnsari, FZ (2007), "Ageing and its herbal treatment", The Pharma Review, 12,131-134.
[26] Chang, RC and So, KF (2008), "Use of antiageing herbal medicine Lyciumbarbarum against aging-associated diseases", Cell and Molecular Neurobiology, 28(5), 643-652.
[27] Verma, S and Singh, SP (2008), "Current and future status of herbal medicines",Veterinary World, 1(11), 347-350.
[28] Alam, S et al. (2007), "Role of herbals in drug delivery system", The Pharma Review, 6 106-107.