

# Polyherbal formulation: A Concept of ayurveda for Kidney Disease

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**Abstract** - Polyherbal formulations are those that incorporate two or more herbs. Ayurveda's medicine formulation is founded on two principles: the use of a single drug and the use of a combination of several drugs. Polyherbal formulation is the term used to describe the latter. Although it is difficult to define in contemporary terms, Ayurveda's idea of polyherbalism is unique. Sarangdhar Samhita (Ayurvedic literature) emphasises the idea of synergism underlying polyherbal compositions. Single herb formulations are well-established because of the potent phytoconstituents they contain, but they are sometimes present in minute amounts that are inadequate to provide the desired therapeutic benefits in certain patients. According to scientific studies, combining these different-potency plants can theoretically produce a greater result than using each plant alone or adding up their individual effects. This positive herb-herb interaction results in synergism, which could be a pharmacokinetic or a pharmacodynamic type of interaction. The excellent efficacy of polyherbal formulations in treating such a wide range of ailments explains their widespread acceptance. Polyherbal formulations have a broad therapeutic range (effective at low doses and safe at high doses), less side effects, eco-friendly, cheaper and easily accessible polyherbal formulations are not always safe. According to the Charaka Samhita, Ayurvedic formulas might cause harm if taken incorrectly. Patients, Ayurvedic practitioners, drug-herb interactions, clinical reproducibility, toxicity owing to faulty production and illogical prescription of polyherbal formulations, as well as legislation and regulations, are all factors that contribute to the difficulties of polyherbal formulations. Polyherbal formulations are becoming more popular, despite the fact that they have a number of drawbacks.

**Keywords** - Polyherbal formulation, Kidney Disease, ayurveda concept

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## INTRODUCTION

Longevity and health are totally depending on the present developments in This combination of many herbs (polyherbal) is advantageous since the powerful phytochemical elements of individual plants are insufficient to deliver the desired therapeutic effect. More than two plants with diverse phytoconstituents and therapeutic potential have been shown to work synergistically to treat human illnesses. The broad therapeutic range of polyherbal formulations, which are efficacious at low doses and safe at large doses yet exhibit fewer negative effects when overused, has made them very popular. Natural ingredients included in Ayurveda make it one of the best methods for treating illness since it restores the body's natural balance while also avoiding additional recurrences. Approximately 80% of the world's population, according to the WHO, still relies on traditional or Ayurvedic treatments for their health and well-being (1-3).

When it comes to treating human ailments, the Indian philosophy behind Ayurveda aims to minimise

suffering while also utilising the significant biodiversity centres provided by the approximately 45,000 herbal plant species, of which approximately 15,000 have been documented for their use in treating a variety of human ailments through the use of single or multiple herbs(4).

Ayurvedic medicine makes use of a wide variety of plant components, including seeds, roots, bark, stems, gum, leaves, flowers, and fruit. Tablets containing root extracts of different plants with potent phytoconstituents that have been scientifically shown to be useful in the treatment of Glomerulonephritis were produced and assessed in this research. Plants included in the research include Angelica officinalis (Umbelliferae), Boerhavia diffusa (Nyctaginaceae), Carica papaya (Caricaceae), Cassia fistula (Fabaceae), Ficus hispida (Moraceae), Fumaria indica (Fumariaceae MATERIALS AND METHODS) and Vitex negundo (Vitexaceae) (Verbenaceae). Tolerability tests and effective doses based on toxicology studies were utilised to determine the amount of medicines included in the formulation. For polyherbal dispersible tablets, 25 mg of extract

powder was employed as the active ingredient in this formulation (5).

## TRADITIONAL MEDICINES

An injury or sickness may be treated using traditional herbal medicine using plants or plant material. This can be done in the raw or processed form. Screening is now being placed on ethnomedicinal medicinal herbs. The social and natural sciences are both included in the ethnopharmacological approach to studying and appraising traditional and herbal medications. Anthropogenic ethnopharmacological investigations are based on ethnographic studies of local usage of nature-derived medicines. Throughout history, herbal products have been utilised extensively to treat a variety of ailments. Because of the wide variety of functionally significant secondary metabolites generated by microbes and plants, natural products and their related structures are valuable sources of innovative medicines (6).

## HERB-HERB COMBINATIONS

In Chinese medicine, polyherbal treatment, or the use of many herbs at once, has been practised for hundreds of years, although there is little empirical evidence to support its efficacy. When compared to a single medicine, a pharmacological combination typically shows encouraging results in the treatment of disorders. Over the last several decades, Western medicine has been using the notion of medication combination to great effect. Cancer and infectious illness patients have found fresh hope in pharmacological combination therapy in recent years. The combination of plants and herbal compounds in a specific recipe has been found to have possible interactions. These include enhancing one another, assisting one another, restraining one another, and being antagonistic to one another. Various infections are treated using polyherbal substances in the Ayurvedic medical system. *Hedychium spicatum*, *Inula racemosa*, and *Clerodendrum serratum*, make up the Bharangyadi polyherbal. *Indukantha Ghritha* (IG) is a regularly recommended ayurvedic polyherbal mixture containing plant components. The outstanding clinical efficacy of the formulations in the Unani system of medicine is also helping it achieve worldwide appeal (7-9). Even though Unani remedies have been used for centuries, there is no recorded proof of their safety or efficacy. As a result of the absence of review, the creation of laws and legislation has been hampered. With the use of *Cissus rotundifolia* leaves and bark and leaves and *Zanthoxylum chalybeum* bark and leaves and *Zanthoxylum chalybeum* bark extract, a polyherbal formulation has been tried and assessed for further in-vitro investigations with great success (9).

## ADVANTAGES OF POLYHERBAL FORMULATION OVER SINGLE HERB

There are several chemical components in ayurveda and herbal medications, which may give the

anticipated activity when combined. Ayurvedic and herbal medicines. Ayurvedic products are seeing a surge in popularity due to the increased popularity of plant-based formulations. In spite of the general belief that herbal remedies are safe, many people take them in combination, and they are derived from plants, which themselves vary widely in species, growing circumstances, and chemical contents that are physiologically active. The availability of numerous active components that combined may generate a potentiating effect that may not be possible by any single molecule gives botanicals a theoretical edge over traditional single-component medications. In polyherbal formulations, pharmacological substances derived from plants are combined to produce synergistic, potentiative, agonistic, and antagonistic effects. Pharmacological principles interact together dynamically to generate maximal treatment effectiveness with minimal adverse effects. Depending on the context, synergism may function in one of two ways. pharmacokinetic synergism refers to a herb's ability to increase the other herbs' absorption, distribution, metabolism, and excretion. However, pharmacodynamic synergism examines the synergistic impact when active elements with equal therapeutic action are directed to a same receptor or physiological system.. In addition, a variety of variables and complications are thought to be the root of illness in the majority of instances, resulting in both apparent and unseen symptoms. Multiple herbs may work together to alleviate the symptoms at the same time. There are several advantages to polyherbalism over single plant formulations due to the synergism. It is clear that a single multi-component formulation may have a superior therapeutic impact. In order to obtain desired pharmacological effects, a lesser dosage of the herbal product would be required, minimising the potential of adverse effects. In addition, patients benefit from PHFs since they eliminate the need to take many herbal formulations at the same time, which promotes greater compliance and a more effective therapeutic outcome. PHF is more popular than single herbal formulations because of all of these advantages. To treat a specific difficulty, polyherbal formulations use many different types of molecules, each of which works via a different method (10, 11).

## AYURVEDIC HERBALS

Ayurvedic medications are split into three categories based on the source of their ingredients: herbal, mineral, and animal. Herbal formulation is one of them that has lately grown in prominence and drawn increasing attention from across the world. This is the most likely scenario, given the dramatic rise in the use of herbal formulations in industrialised nations like the United States and Europe over the previous several years. According to the WHO, almost 80% of the world's population still receives

the majority of their medical treatment via the use of traditional medicines.

One of the world's most biodiverse regions, the Indian subcontinent is home to more than 45,000 species of plants.

Its long-standing role as a repository for herbal remedies may be traced in part to its very diverse flora. Seven thousand seven hundred and fifty of the approximately 15,000 species of medicinal plants that have been discovered in India are now being used to cure a range of maladies by the country's native people. In Ayurveda's medicinal systems, there are 700 distinct plant species.

Chakara Samhita and Sushruta Samhita reference the usage of these herbals in ancient Ayurvedic literature. There are many different ways to isolate and purify herbs, as well as several types of preparations that may be used. An "herbal drug" is a word used to describe the components of a plant that are employed in the preparation of medicines (leaves, flowers, seeds, roots, barks, stems, and etc.). All of the herb's constituent parts are used to their full potential in herbal preparations such as Kwatha (Decoction), Phanta (Hot infusion), Hima (Cold infusion), Arka (Liquid Extract), Churna (Powders), Guggul (Resins and balsams), and Taila (Medicated oil), among others (12).

More and more pharmacologically active components in Ayurvedic medicines, as well as the therapeutic value of these compounds, have been discovered as a result of modern scientific advances. Saponins and tannins, alkaloids, alkenylphenols, flavonoids and terpenoids are the primary phytochemical components of herbal medicines that are responsible for the intended therapeutic effect. These include sesquiterpene lactones and sesquiterpene esters. There may be more than one phytochemical ingredient in a single plant that acts together to produce pharmacological effects. The following are some examples of Ayurvedic herbs: Because of its high concentration of saponin glycosides, Arjuna (*Terminalia arjuna*) is particularly effective in improving heart muscle function and pumping capacity, while its flavonoids provide antioxidant protection and vascular support. Sesquiterpenes, shogaols, and gingerols are found in the volatile oil of the ginger plant (*Zingiber officinale*), whereas bisabolene, zingiberene, and the antibacterial zingiberol are found in the volatile oil of the ginger plant (*Zingiber officinale*). Aromatic buds of *Syzygium aromaticum* and the leaves of *Cinnamomum zeylanicum* were dried and pressed to produce eugenol-rich clove oil and cinnamon leaf oil (13).

There are three primary phytoconstituents in lemongrass (*Cymbopogon citrates*) essential oil: geraniol, neral, and myrcene. Myrcene has no antibacterial effect in vitro like the first two did. In contrast, when myrcene was added to either of the two ingredients, it boosted their effectiveness (14).

## SINGLE HERBAL VERSUS POLYHERBAL FORMULATION

Two ideas underlie Ayurvedic medication formulation: the use of a single drug and the use of many medicines, which is referred to as "PHF." Traditionally, a therapeutic herbal technique known as polypharmacy or polyherbalism relies on the synergistic effects of many medicinal plants.

While it is widely documented that plants contain active phytochemical elements, they are often present in little amounts and are seldom adequate to provide desired therapeutic effects. For this reason, scientific research have showed that the total of the different effects of these plants of variable strength may potentially generate a bigger outcome than the individual usage of the plant. Synergism refers to the phenomena of beneficial herb-herb interactions. The pharmacological effects of several herbal active ingredients are amplified when combined with those of other plants, although they are not readily apparent when taken on their own. (15)

There are two ways in which synergism works depending on the nature of the interaction (i.e., pharmacodynamics and pharmacokinetic).

When one herb aids another in absorption, distribution, metabolism, and excretion, it is called synergism. On the other hand, pharmacodynamic synergism is a study of the synergistic impact when active elements with comparable therapeutic action are addressed to the same receptor or physiological system as one another. In addition, a variety of variables and complications are thought to be the root of illness in the majority of instances, resulting in both apparent and unseen symptoms. To give comprehensive treatment, a mixture of herbals may work on many targets at once. (16)

**Table 1: Examples of marketed Polyherbal formulation**

PHF (company)	Herbals	Pharmacological action
Diabet (Herbal Galenicals, India)	Curcuma longa Cosciniun fenestratum Strychnos potatorum Tamarindus indica Tribulus terrestris Phyllanthus reticulatus	Antidiabetic
Arthosansar (Pradhan Herbal Company, India)	Comiphora wightii Boswellia serrata Pluchea lanceolata Ricinun communis Zingiber officinale Withani somnifera	Antiarthritic
Kutajarista (Laboratory preparation)	Madhuca longifolia Holarrhena antidysenterica Gmelina arborea Woodfordia fruticosa Vitis vinifera Honey	Useful in the treatment of sprue, dysentery and diarrhea
Vidakana Choomam	Embelia ribes Morigna oleifera Piper longum	Useful for liver disorders especially jaundice and steatosis

## REASON OF USING PHF

Due to the fact that PHF offers various benefits that are not present in allopathic medications, it has lately become popular across the globe.

Furthermore, PHFs are proven to be very effective in a wide range of illnesses. It is well known that phytoconstituents in herbal medicines have a positive impact on their therapeutic properties, and this is further enhanced when they are combined in PHFs. The efficacy of PHF has been extensively studied and documented in several studies that have appeared in prestigious international publications. According to a UK statistical analysis, the primary driver for the usage of medicinal herbalism is the treatment's efficacy and beneficial results. (17)

The second thing to keep in mind is that PHFs tend to have a broad therapeutic spectrum. Even at modest doses, most of these drugs are effective and safe; as a result, they have a low risk to benefit ratio. Diakyur, a hypoglycemic PHF, is an excellent example. At the high dosage of 12800 mg/kg p.o., Diakyur did not cause any toxic symptoms in the experimental animals for 72 hours; nevertheless, at the lower dose of 1600 mg/kg p.o., Diakyur is safe for long-term therapy. At a dosage of 1600 mg/kg, the PHF demonstrates hypoglycemic and antioxidant properties (p.o.). [38] Allopathic hypoglycemia medicines such tolbutamide, glipizide, and glicazide, which have a restricted therapeutic range, are in direct opposition to this approach. (18)

PHFs, as long as they are made and administered correctly, have less negative effects than allopathic medications on average. There are numerous undesirable side effects associated with the administration of modern allopathic medications,

despite their efficacy as therapeutic aids. These include but are not limited to the following: sleep deprivation and vomiting as well as fatigue and dry mouth as well as impotence and confusion. Dyspepsia, stomach ulcers, salt and fluid retention, and hypertension are common adverse effects of nonsteroidal anti-inflammatory medications (NSAIDs) given for the treatment of rheumatoid arthritis (RA). These negative effects may be avoided or minimised by using Ayurvedic therapy. RA patients who received a year of Ayurvedic therapy utilising internal herbal medications showed significant improvement without any indication of organ toxicity, according to the findings of one recent research. [40] According to a research by Jawla et al., none of the 500 people who filled out a questionnaire reported any negative side effects from herbal medicines, and 48% of those people chose the Ayurvedic approach for treating common illnesses. The public's acceptability of the medicine system seems to be affected by the side-effect criteria. [41,42]

The fact that PHFs are derived from natural sources means that they are less expensive, less harmful to the environment, and easier to get than allopathic medications. Because of their lower cost and easier availability, they are becoming more popular across the world, particularly in underdeveloped nations and rural regions that lack access to more expensive contemporary therapies. To add to the historical significance, in certain cultures, polyherbal treatments have long been revered as a core part of folklore, rooted in centuries of trial and error. Simply put, PHF are more widely accepted in society and culture. (19)

PHF is a great therapy because of its effectiveness, safety, affordability, ubiquity, and ease of use; hence, patients are more likely to adhere to treatment and achieve outstanding therapeutic outcomes.

## MAJOR PROBLEMS RELATED TO PHF USAGE

There are certain inherent limitations to Ayurvedic PHFs that limit their ability and usefulness in therapy, despite their immense benefits to humans. In addition to patients and Ayurvedic practitioners, the sources and manufacturing process of PHFs are at fault as well as laws and regulations in place to protect them all.

That Ayurvedic PHFs are inherently safe is a widely held belief, which is false. When Ayurvedic medications are produced or used incorrectly, as outlined in the Charaka Samhita, they might have negative consequences. The usage of PHFs with allopathic medications is on the rise since most patients do not tell their doctors of the simultaneous therapy. But many people are unaware of the probable drug-herb interactions, which may alter their pharmacological or toxicologic effects, resulting

in negative health outcomes. Several Ayurvedic herbs typically utilised in the preparation of PHFs have been implicated in negative drug-herb interactions, according to the literature. (20)

An Ayurvedic PHF's clinical repeatability in clinical trials is difficult to obtain. Standardizing the production of Ayurvedic PHFs was made easier thanks to monographs in the Ayurvedic Pharmacopoeia of India, commonly known as the "Ayurvedic formulary of India." This, however, would not be enough to assure that every batch of PHFs would be identical. When deciding on the beginning material for PHFs, the environment, growing season, harvesting circumstances, storage technique, and pharmaceutical processing are all things to keep in mind, according to Charaka samhita. It is difficult to standardise the final product for repeatable quality since the components of crude raw herb materials might vary as a result of varied geographical locations, climate conditions, environmental dangers, harvesting techniques, collecting procedures, and so on. As a result of this batch-to-batch variance, the efficacy and safety of PHFs would be directly affected. Changing the dose regimen to get the desired therapeutic effect seems to be a hassle as well.

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**Table 2: Examples of possible drug- herb interaction**

Ayurvedic herbs contained in PHF	Possible drug-herb interaction
Garlic ( <i>Allium sativum</i> ), ginger ( <i>Zingiber officinale</i> ), ginkgo ( <i>Ginkgo biloba</i> ) factor	Interfere with NSAIDs and warfarin by increasing the risk of bleeding, mainly due to inhibition of platelet aggregation. Limited production of coagulation mediators. Antagonism of platelet activating
St John's wort ( <i>Hypericum perforatum</i> ) for depression treatment	Induce hepatic microsomal enzyme cytochrome P-450, thus increases the metabolism of certain drugs such as digoxin and theophylline, rendering them less effective
Meadowsweet ( <i>Filipendula ulmaria</i> ) for anti-inflammatory action	Warfarin and carbamazepine, which are strongly protein bound, may be replaced with other medications, raising the risk of side effects.

### CONCLUSION

Use of PHF in traditional Ayurvedic medicine is still beneficial today. PHFs use the Ayurvedic ideas of Panchamahabhutas and Tridoshas to treat ailments holistically. Science has enhanced Ayurvedic formulations of PHFs by studying various phytoconstituents and discovering beneficial herb combinations that work together to produce desired results. Ayurvedic PHFs are presently witnessing a "renaissance" over the globe because of their equivalent efficacy, less side effects, and more acceptability than allopathic drugs. Understanding and misperceiving PHF safety might result in the opposite effect, such as toxicity and undesirable interactions. As a result of insufficient regulatory control and the irresponsibility of manufacturers, the quality of the PHFs produced has also been damaged. To prevent PHFs from wreaking havoc on the environment, governmental oversight and public awareness campaigns are essential. It is only when they are utilised appropriately and reasonably that Ayurvedic PHFs may have a good influence on health.

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