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Review Article

Polyherbal Formulation Concept for Synergic Action: A Review

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ABSTRACT

Formulations restrain 2 or more than 2 herbs are called polyherbal formulation. Drug formulation in Ayurveda is based on 2 principles: Use as a single drug and use of more than one drug. The last is known as polyherbal formulation. The idea of polyherbalism is peculiar to Ayurveda even though it is tricky to explain in term of modern parameters. The *Ayurvedic* literature *Sarangdhar Samhita* tinted the idea of polyherbalism to attain greater therapeutic efficacy. Polyherbal formulation has been used all around the earth due to its medicinal and therapeutic application. It has also recognized as polyherbal therapy or herb-herb combination. The active phytochemical constituents of individual plants are inadequate to attain the desirable therapeutic effects. When polyherbal and herbo-mineral formulations combining the multiple herbs in a meticulous ratio, it will give an enhanced therapeutic effect and decrease the toxicity. The active constituents used from individual plant are inadequate to provide attractive pharmacological action. There are evidences that crude plant extracts often have greater potency rather than isolated constituents. In traditional medicine whole plants or mixtures of plants are used rather than isolated compounds. Due to synergism, polyherbalism confers some benefits which are not accessible in single herbal formulations. Polyherbal formulations express high effectiveness in numerous diseases with safe high dose. Based on the nature of the interaction, there are 2 mechanisms on how synergism acts (*i.e.*, pharmacodynamics and pharmacokinetic). In words of pharmacokinetic synergism, the capacity of herb to ease the absorption, distribution, metabolism and elimination of the other herbs is focused. Pharmacodynamics synergism on the other hand, studies the synergistic effect when active constituents with similar therapeutic activity are targeted by diverse mechanism of action. The present review encompasses all the significant features of polyherbal formulation.

Keywords: Polyherbal formulation, Ayurveda, Active constituents, Pharmacodynamics, pharmacokinetic

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INTRODUCTION

In the few decades, there has been exponentially growth in the field of herbal medicines. Nature always stands as a golden mark to exemplify the outstanding phenomena of symbiosis. Today about 80% of people in developing countries still relay on traditional medicine based largely on the different species of plants for their primary health care. About 500 of plants with medicinal uses are mentioned in ancient literature and 800 plants have been used in indigenous system of medicine. The various indigenous systems such as Ayurveda, siddha, unani use several plant species to treat different ailments ¹⁻³. Tyler defines herbal medicines as crude drugs of vegetable origin utilized for the treatment of disease states, often of a chronic nature, or to attain or maintain a condition of improved health. Current demands for herbal medicines have resulted in an annual

market of \$1.5 billion and increasingly widespread availability. The treatment of injury or disease by plants or plant material, either in the crude or processed state, is known as traditional herbal medicine. The medicinal plants with ethnomedicinal values are currently being screened for their therapeutic potential ⁴. Herbal product has been used abundantly over the years in curing several diseases. Natural products and related structures are essential sources of new pharmaceuticals, because of the immense variety of functionally relevant secondary metabolites of microbial and plant species ⁵. Herb-herb combinations also known as polyherbal therapy have been used in Chinese medicine practice for thousands of years, yet scientific evidence of their therapeutic benefits is lacking ⁶. Drug combination often produces a promising effect in treatment of diseases over a single drug. The concept of drug combination has

been well established in Western medicine and remarkable success has been achieved over the decades. In recent years, drug combination therapies in cancer and infectious diseases have offered new hope to patients ⁷. Naturally occurring herbs and herbal ingredients organized into certain formula have been shown to have potential interaction effects. These include mutual enhancement, mutual assistance, mutual restraint and mutual antagonism ⁸. In the Ayurvedic system of medicine mainly polyherbal compounds are used for treatment of various infections. The Unani system of medicine is also gaining global acceptance due to the amazing clinical efficiency of the formulations. Although Unani medicines have long been used, there is negligible documented evidence regarding their safety and effectiveness. The lack of evaluation has, in turn, slowed down the development of regulations and legislations ⁹. The practice of herbal medicine spread from Asia to Europe. The Greeks are known to have acquired knowledge of it over the period from 468-377 BC. In turn, the Romans learned of it from the Greeks around 100 BC. The Islamic World learned of and began to practice this science around the time the Roman Empire fell, in the 5th century. By the 10th century, the Anglo-Saxon World was practicing herbal science and describing it in writings. Throughout the middle ages, most herbalism was practiced under the authority of the church, which maintained the authority to grow medicinal herbs and to introduce new herbal medicines ¹⁰.

Advantages of polyherbal formulation over single herb

Ayurvedic and herbal medicinal products contain a combination of botanicals; each of these contains a number of chemical compounds that may give the anticipated activity in combination. The increasing interest in the use of plant-based formulations is leading to a fast growing market for Ayurvedic ¹¹. Herbal medicines are in widespread use and although many believe herbal medicines are safe, they are often used in combination and are drawn from plant sources with their own variability in species, growing conditions, and biologically active constituents. A major hypothetical advantage of botanicals over conventional single-component drugs is the presence of multiple active compounds that together can provide a potentiating effect that may not be achievable by any single compound. Polyherbal formulations have plant-based pharmacological agents which may exert synergistic, potentiative, agonistic antagonistic actions by virtue of its associated diverse active principles themselves.

These pharmacological principles work together in a dynamic way to produce maximum therapeutic efficacy with minimum side effects ¹². Based on the nature of the interaction, there are two mechanisms on how synergism acts (i.e., pharmacodynamics and pharmacokinetic) ¹³. In terms of pharmacokinetic synergism, the ability of herb to facilitate the absorption, distribution, metabolism and elimination of the other herbs is focused. Pharmacodynamics synergism on the other hand, studies the synergistic effect when active constituents with similar therapeutic activity are targeted to a similar receptor or physiological system. Other than that, it is believed that multiplicity of factors and complications cause diseases in most of the cases, leading to both visible and invisible symptoms. Here, combination of herbals may act on multiple targets at the same time to provide a thorough relief ¹⁴. Due to synergism, polyherbalism offers some great benefits which lacks in single herbal formulation. It is evident that better therapeutic effect can be reached with a single multi-constituent formulation. For this, a lower dose of the herbal preparation would be needed to achieve desirable pharmacological action, thus reducing the risk of deleterious side-effects. Besides, PHFs bring to improved convenience for patients by eliminating the need of taking more than one different single herbal formulation at a time, which indirectly leads to better compliance and therapeutic effect. All these benefits have resulted in the popularity of PHF in the market when compared to single herbal formulation ¹⁵. Polyherbal formulation also having multiple types of molecules against a disease complication so different molecules cure a disease by different mechanism so provide a complete therapy against a disease condition ¹⁶.

Limitations of polyherbal formulation

When combinations of plants with these constituents are combined together it may show better activity when compared to the individual extract. But at the same time presence of many constituents may lead to chemical incompatibility which may result in instability ¹⁷. In India, whereas most of the Ayurvedic PHFs are manufactured and exported, the regulation of Ayurvedic herbal preparation manufacturing is somewhat less stringent, despite the establishment of Drugs and Cosmetic Act to control the manufacture and quality control. According to the good clinical practices, toxicity studies and clinical trials on herbal formulations are not mandatory for application of patents and grant of manufacturing licenses to the Ayurvedic herbal formulation manufacturer ^{8,19}.

Table 1: Polyherbal formulation along with the different pharmacological activities

Anti-inflammatory activity			
Product	Composition of polyherbal formulation	Experimental model	Ref
DHU001	<i>Ficus carica, Liriope spicata, Platycodon grandiflorum, Schisandra chinensis, Glycyrrhiza uralensis, Zingiber officinale, Mentha arvensis</i>	Dinitrofluorobenzene-induced contact dermatitis	20
Wu-Zi-Yan- Zong	<i>Cuscuta chinensis, Lycium barbarum, Rubus chingii, Schizandra chinensis, Plantago asiatica, Epimedium brevicornu</i>	Lipopolysaccharides induced neuro inflammatory	21
IBS-20	20-herb Chinese medicinal formula	Inhibit proinflammatory cytokine production	22
Jatyadi ghrita	<i>Jasmine officinale, Azadirachta indica, Berberis aristata, Curcuma longa, Picrorrhiza kurroa, Rubia cordifolia, T. Dioica, Aristolochia indica, Hemidesmus indicus, Randia spinosa, Glycyrrhiza glabra, Cow's ghee.</i>	Carrageenan-induced model	23
Bhux	<i>Commiphora mukul, Terminalia arjuna, Boswellia serrata, Semecarpus anacardium, Strychnos nux vomica</i>	Carrageenan-induced model	24
Brazilian polyherbal formulation	<i>Eucalyptus globulus, Peltodon radicans, Schinus terebinthifolius</i>	TPA, capsaicin-induced mouse ear edema, Carrageenan-induced model	25
Entox	<i>Terminalia chebula, Embelica officinalis, Punica granatum, Terminalia arjuna, Rubia cordifolia, Withania somnifera, Tinospora cordifolia, Curcuma longa</i>	Carrageenan-induced model and cotton pellet granuloma method	26
Triphla	<i>Emblica officinalis gaertn, Terminalia chebula, Terminalia bellerica</i>	Adjuvant-induced arthritis	27

	<i>gaertn</i>		
Unani eye drop	<i>Berberis aristata, Cassia absus, Coptis teeta, Symplocos racemosa, Azadirachta indica, Rosa damascena</i>	Turpentine liniment-induced ocular inflammation in rabbit's eye	28
PM014	<i>Stemona sessilifolia, Asparagus cochinchinensis, Scutellaria baicalensis, Schizandra chinensis, Rehmannia glutinosa, Prunus armeniaca, Paeonia suffruticosa.</i>	Cockroach allergen-induced model.	29
Sudard	<i>Commiphora mukul, Pluchea lanceolata, Paderia foetida, Vitex negundo, Zingiber officinalis, Ricinus communis, Lepidium sativum, Colchicum luteum, Smilax glabra, Strychnous nuxvomica, Mineral pitch</i>	Formalin, carrageen induced model	30
Septilin	<i>Balsamodendron mukul, Sank Bhasma, Maharasnadi qoath, Tinospora cordifolia, Emblica officinalis, Moringa pterigosperma, Glycyrrhiza glabra</i>	Carrageenan-induced model, cotton pellet granuloma and Freund's adjuvant induced-arthritis models, Tail flick response, Glacial acetic acid induced writhing	31
Ghanaian	<i>Alstonia boonei, Rauvolfia vomitoria, Elaeis guineensis</i>	Carrageenan induced model	32
PHF	<i>Aegle marmeloes, Coriandrum sativum, Cyperus rotundus, Vetiveria zinzanoids</i>	Acetic acid-induced colitis in mice and indomethacin-induced enterocolitis in rats	33
Ajmodadi churna	<i>Trachyspermum ammi, Cedrus deodara, Piper longum, Terminalia chebula, Argyreia nervosa, Zingiber officinale</i>	Carrageenan-induced model and air pouch inflammation models	34
Antidiabetic activity			
Diarun plus	<i>Emblica officinalis, Curcuma longa, Momordica charantia, Eugenia jambolana, Trigonella foenum graecum, gymnema sylvestre and salacia reticulata.</i>	Streptozotocin induced model.	35
Diabrid	<i>Gymnema sylvestre, Momordica charantia, Eugenia Jambolana, Trigonella graeceium</i>	Alloxan-Induced model	36
Okudiabet	<i>Stachytarpheta angustifolia, Alstonia congensis, Xylopi aethiopica</i>	Alloxan- induced model	37
PHF	<i>Allium sativum, Cinnamomum zeylanicum, Citrullus colocynthis, Juglans regia, Nigella sativa, Olea europaea, Punica granatum, Salvia officinalis, Teucrium polium, Trigonella foenum, Urtica dioica, Vaccinium arctostaphylos</i>	Streptozotocin-induced model	38
PHF	<i>Cystoseira trinodis, Allium sativum, Glycyrrhiza glabra, Zingiber officinale</i>	Alloxan-induced model	39
PHF	<i>Foeniculum vulgare, Brassica alba</i>	Glucose tolerance tests	40
Ayurslim	<i>Garcinia camogia, commiphora wightii, gymnema sylvestre, terminalia chebula, trigonella foenum-graecum</i>	Streptozotocin induced model	41
PHF	<i>Salacia oblonga, Salacia roxburgii, Garcinia indica, Lagerstroemia parviflora</i>	Streptozotocin induced model	42
Hal	<i>Momordica charantia, Trigonella foenum-graecum, Withania somnifera</i>	Glucose tolerance test, streptozotocin model	43
Triphla churna	<i>Emblica officinalis, Terminalia chebula, Terminalia bellerica</i>	Rat model of insulin resistance.	44
Diasulin	<i>Cassia auriculata, Caccinia indica, Curcuma longa, Emblica officinalis, Gymnema sylvestre, Momordica charantia, Scoparia dulcis, Syzigium aumini, Tinospora cordifolia, Trigonella foenum graecum.</i>	Alloxan induced model	45
Dihar	<i>Syzygium cumini, Momordica charantia, Emblica officinalis, Gymnema sylvestre, Enicostemma Littorale, Azadirachta indica, Tinospora cordifolia, Curcuma longa</i>	Streptozotocin induced model	46
Siddha PHF	<i>Asparagus racemosus, Emblica Officinalis, Salacia oblonga, Syzygium aromaticum, Tinospora cordifolia</i>	In the liver of type 2 diabetic adult male rats	47
Wen-pi-tang-Hab-Wu-ling-san	<i>Codonopsis pilosula, Salvia miltiorrhiza, Pinellia ternate, Coptis chinensis, Epimedii herba, Rhei radix, Perilla frutescens Glycyrrhiza uralensis, Artemisia capillaris, Alisma plantago-aquatica, Atractylodes macrocephala, Polyporus umbellatus, Cinnamomi ramulus</i>	Streptozotocin-induced model	48
PHF	<i>Alnus hirsuta, Rosa davurica, Acanthopanax senticosus, Panax schinseng</i>	Streptozotocin induced model	49
PHF	<i>Withania somnifera, Allium sativum, Gymnema sylvestre, ferula foetida, murraya koenigii</i>	Streptozotocin induced model	50
Gynocare capsules	<i>Ashoka, Vasaka, Durva, Chandan, Musk</i>	Safety profile on albino wistar rats	51
Ziabeen	<i>Aloe barbadensis, Azedarachta indica, Eugenia jambolana, Gymnema sylvestre, Swertia chirata, Momordica charantia, Holarrhena antidysenterica, Piper nigrum.</i>	Normal and alloxan-induced model	52
PHF	<i>Tinospora cordifolia, Adhatoda vasica, Stevia rebaudiana, Pterocarpus marsupium, Withania somnifera, Tridax procumbens, Boer haavia diffusa, Syzygium cumini</i>	Alpha amylase inhibitory assay, haemoglobin Glycosylation	53
PHF	<i>Tribulus terrestris, Piper nigrum, Ricinus communis</i>	Alloxan induced model	54
Transina	<i>Withania somnifera, Tinospora cordifolia, Eclipta alba, Ocimum sanctum, Picrorrhiza kurroa, Shilajit,</i>	Streptozotocin, hyperglycaemia, SOD	55
PHF	<i>G. pentaphylla, T. procumbens, M. indica</i>	Streptozotocin-nicotinamide induced	56
Hyponidd	<i>Momordica charantia, Melia azadirachta, Pterocarpus marsupium, Tinospora cordifolia, Gymnema sylvestre, Enicostemma littorale,</i>	Streptozotocin induced model	57

	<i>Emblica officinalis, Eugenia jambolana, Cassia auriculata, Curcuma longa</i>		
Cogent db	<i>Azadirachta indica, Curcuma longa, Phyllanthus emblica, Rotula aquatic, Syzigium cumini, Terminalia chebula, Terminalia bellerica, Tribulus terrestris, Trigonella foenum graecum</i>	Alloxan-induced model	58
Diasulin	<i>Cassia auriculata, Coccinia indica, Curcuma longa, Emblica officinalis, Gymnema sylvestre, Momordica charantia, Scoparia dulcis, Syzigium cumini, Tinospora cardifolia, Trigonella foenum-graecum</i>	Alloxan-induced model	59
Okchun-san	<i>Oryza sativa, Glycyrrhiza uralensis, Pueraria thunbergiana, rehmannia glutinosa, Schizandra chinensis, Trichosanthes kirilowii</i>	C57BL/KsJDb/db type-2 diabetic mice	60
DRF/AY/5001	<i>Emblica officinalis, Gymnema sylvestre, Momordica charantia, Pterocarpus Marsupium, Syzigium cumini, Terminalia Bellerica, Terminalia chebula</i>	Epinephrine and alloxan-induced model	61
Diabegon	<i>Aegle marmelos, Asfetum Punjabinum, Berberis aristata, Citrullus culocynthis, Curcuma Longa, Cyperus rotondous, Embelica officinalis, Eugena Jambolana, Gymnema sylvestre, Momordica charantia, Piper Longum, Pterocarpus marsupion, Plumbago zeylanica, Swertia Chirata, Terminalia balerica, Terminalia chebula, TrigonellaFoenum-graecum, Zingiber officinale</i>	High fructose diet-fed rats	62
Glyoherb	<i>Gudmar, Mahamejva, Katuki, Chirata, Karela, Indrajav, Amla, Gokshur, Harde, Jambubij, Methi, Neem patti, Chanraprabha, Arogyavardhini, Harida, Bang bhasma, Devdar</i>	Streptozotocin-induced model	63
MAC-ST/001	<i>Azadirachta indica, Caesalpinia Bonducella, Momordica charantia, Syzygium cumini, Trigonella F-graecum</i>	streptozotocin-induced model	64
Dia-2	<i>Allium sativum, Lagerstroemia speciosa</i>	3T3-L1 cells	65
Sr10	<i>Radix astragali, Radix codonopsis, Cortex lycii</i>	Type 2 diabetic mice	66
Diakyur	<i>Cassia auriculata, Cassia javanica, Gymnema sylvestre, Mucuna pruriens, Salacia reticulata, Syzygium jambolanum, Terminalia arjuna</i>	Alloxan-induced model	67
Karnim plus	<i>Azadirachta indica, Momordica charantia, Ocimum sanctum, Picrorrhiza kurroa, Zingiber officinale</i>	Alloxan-induced model	68
PHF	<i>Azadirachta indica, Gymnema sylvestre, Momordica charantia, Syzygium cumini, Trigonella foenum</i>	Alloxan-induced model	69
5EPHF	<i>Aegle marmelos, Murraya koenigii, Aloe vera, Pongamia pinnata, Elaeodendron glaucum</i>	Alloxan-induced model	70
PHF	<i>Eugenia jambolana, Gymnema sylvestre, Momordica charantia, Mucuna pruriens, Trigonella Foenum graecum, Withania somnifera</i>	93 diabetic patients	71
Diabecon (d-400)	<i>Asparagus racemosus, Balsamodendron Mukul, Eugenia jambolana, Gymnema Sylvestre, Momordica charantia, Ocimum Sanctum, Pterocarpus marsupium</i>	30/ 43 diabetic patients	72, 73
PHF	<i>Aloe vera, Cocos nucifera, Curcuma longa, Glycyrrhiza glabra, Musa paradisiacal, Pandanus odoratissimus</i>	20 patients	74
Glucoselevel	<i>Atriplex halimus, Juglans regia, Olea europea, Urtica dioica</i>	16 patients	75
Diamed	<i>Azadirachta indica, Cassia auriculata, Momordica charantia</i>	Alloxan-induced model	76
Mersina	<i>Gymnema sylvestre, Momordica charantia, Syzium cumini, Phyllanthus emblica, Trigonella foenum graecum, Coccinia indica, Tinospora cordifolia, Melia azadirachta, Javakhar, Cassia auriculata</i>	Cholesterol, TGL, SGPT, SGOT, ALP, BUN, creatinine, glucose	77
Byesukar	<i>Cassia auriculata, Eugenia jambolana, Thespesia populnea</i>	Alloxan-induced model	78
Diashis	<i>Syzygium cumuni, Gymnema sylvestre, Holarrhena antidysenterica, Tinospora cordifolia, Pongamia pinnata, Asphultum, Psoralea corylifolia, Momordica charantia</i>	Streptozotocin induced model	79
APKJ-004	<i>Eugenia jambolana, Cinnamomum zeylenicum</i>	Streptozotocin induced model	80
Madhumeh	<i>Musta, Daruharidra, Arjuna, Khadir, Lodhra, Guduchi, Patol, Vata, Udumbar, Gudmar, Asana, Shilajit, Kumbha, Nimba</i>	Streptozotocin- nicotinamide induced model	81
Li85008f or Adipromin	<i>Moringa olefera, Murrya koenigii, Curcuma longa</i>	Insulin sensitivity linked with obesity	82
Niddwin	<i>Tinospora cordifolia, Gymnema sylvestre, Terminalia tomentosa, Tribulus terrestris, Emblica officinalis, Mucuna pruriens, Sida cordifolia, Withania somnifera, Terminalia belerica, Terminalia chebula, Momordica charantia</i>	Alloxan induced model	83
BCB	<i>Aloe vera, Acinos ravens, Chenopodium murale, Cinnoamomum aromaticum, Citrus aurantifolia</i>	Lipid peroxidation assay	84
SH-01D	<i>Tinospora cardifolia, Salacia reticulata, Aegle marmelos, Melia azadirachta, Cyprus rotundus, Syzygium cumini, Phyllanthus emblica, Curcuma longa, Vanga bhasma</i>	Dexamethasone and fructose-induced insulin resistance	85
Mehaharadashem ani	<i>Haritaki, Amalaki, Bibhitaki, Guduchi, Haridra, Kiratatikta, Karavellaka, Asana, Meshashringi, Hatavar</i>	Reduced blood sugar level	86
Dianex	<i>Gymnema sylvestre, Eugenia jambolana, Momordica charantia, Azadirachta indica, Cassia auriculata, Aegle marmelose, Withania somnifera, Curcuma longa</i>	Streptozotocin induced model	87
Some polyherbal formulation in market to treat diabetes ex. Diabecon, Diasulin, Pancreatic tonic 180 cp, Ayurveda alternative Herbal formula to Diabetes, Dia-care, Diabetes-daily care, Diabecure, Diabeta, Syndrex ⁸⁸ .			
Antihistaminic activity			
HK-07	<i>Curcuma longa, Zingiber officinale, Piper longum, Emblica officinalis,</i>	Active anaphylaxis model in rats.	89

	<i>Terminalia bellerica, Ocimum sanctum, Adhatoda vasica, Cyperus rotundus</i>	histamine-induced in guinea pigs	
KOB0 ₃	<i>Atractylodis rhizoma, Astragali radix, Saposhnikovia radix, Osterici radix, Scutellariae radix</i>	Systemic anaphylaxis, ovalbumin-induced allergic rhinitis	90
Unani eye drop	<i>Berberis aristata, Cassia absus, Coptis teeta, Symplocos racemosa, Azadirachta indica, Alum and distillate of Rosa damascene</i>	Isolated guinea pig ileum	91
Novel polyherbal formulation	<i>Adhatoda vasica, Clerodendrum serratum, Curcuma longa, Solanum xanthocarpum, Piper longum</i>	Mast cell degranulation, triple antigen-induced anaphylaxis in rats	92
Bharangyadi	<i>Clerodendrum serratum, Hedychium spicatum, Inula racemosa</i>	Histamine induced model	93
Ashmi	<i>Ganoderma lucidum, Sophora flavescens, Glycyrrhiza uralensis</i>	Th2 cytokine secretion, eotaxin -1 secretion	94
AKL1	<i>Picrorrhiza kurroa, Apocynin, Picrorrhiza kurroa, Zingiber officinale, Ginkgo biloba.</i>	RDBPC cross-over study	95
CUF2	<i>Astragalus mongholius, Cordyceps sinensis, Radix stemonae, Bulbus fritillariae, Radix scutellariae</i>	Double-blind, placebo-controlled trial	96
Pentapala-04	<i>Adhatoda vasica, Ocimum sanctum, Coleus aromaticus, Glycyrrhiza glabra, Alpinia galangal</i>	Al(OH) ₃ induced lung damage	97
Bresol, (Hk-07)	<i>Curcuma longa, Ocimum sanctum, Adhatoda vasica, trikatu, Triphala, Embelia ribes, Cyperus rotundus, Cinnamomum zeylanicum, Elettaria cardamomum, Cinnamomum tamala, Mesua ferrea</i>	Phase III clinical trial	98
E-721B	<i>Rhus succidanea, Solanum xanthocarpum, Tylophora indica, Albizzia lebeck, Glycyrrhiza glabra, Achyranthes aspera</i>	Acetylcholine induced bronchospasm in guinea pigs	99
Antioxidant activity			
Bharangyadi	<i>Clerodendrum serratum, Hedychium spicatum, Inula racemosa</i>	ABTS, superoxide anion, lipid per-oxidation assay	100
AVS022	<i>H. perforate, C. micracantha, C. indicum, F. racemosa, T. triandra</i>	HaCaT cells line	101
PHF	<i>Achillea millefolium, Hyssopus officinalis, Equisetum arvense, Echinacea purpurea</i>	DPPH, ABTS assays	102
NR-ANX-C	<i>W. somnifera, O. sanctum, C. sinensis</i>	Haloperidol-induced catalepsy, brain SOD	103
AO-8	<i>Mangifera indica, Glycyrrhiza glabra, Vitis vinifera, Syzygium aromaticum, Emblica officinalis, Daucus carota</i>	lipid peroxidation	104
PHF	<i>Cajanus cajan, Lawsonia inermis, Mimosa pudica, Uraria picta, Operculina turpethum</i>	Glutathione, superoxide dismutase, lipid peroxidation	105
Triglize	<i>Terminalia arjuna, Cissus quadrangularis, Boerhaavia diffusa, Commiphora mukul, Phyllanthus embilica, Terminalia bellerica, Terminalia chebula, Tribulus terrestris, Allium sativum, Trigonella foenum graecum</i>	DPPH, LPS-induced free radicals	106
Panchvalkala	<i>Ficus benghalensis, F. glomerata, F. religiosa, F. virensand, Thespesia populnea</i>	DPPH, reducing power assay	107
Sugar remedy	<i>Bitter melon, Gudmar, Ashwagandha, Jamun, Shilajit, Fenugreek, Triphala, Cinnamon, Vijaysar</i>	Glutathione, superoxide dismutase, catalase, malondialdehyde level	108
Triphala	<i>Terminalia chebula, Terminalia bellerica, Emblica officinalis</i>	DPPH method, lipid peroxide assay	109
Amalakayas rasayana	<i>P. emblica, A. galanga, A. racemosus, B. diffusa, C. asiatica, D. gangiticum, L. reticulata, T. chebula, T. cordifoli</i>	DPPH, superoxide anion radical scavenging activity	110
D-Diabetes	Nineteen herbs	Fe reducing method	111
ALLER-7/NR-A2	<i>Phyllanthus emblica, Terminalia chebula, Terminalia bellerica, Albizzia lebeck, Pipernigrum, Zingiber Officinale, Piper longum</i>	DPPH, ABTS, hydroxyl superoxide assay	112
Stressroak	<i>Withania somnifera, Ocimum sanctum, Phyllanthus emblica, Mangifera indica, Shilajit</i>	Glutathione peroxidase, GSH reductase, catalase	113
HD-03/ES	<i>Cyperus rotundus, Cyperus scariosus</i>	DPPH, reducing power, ORAC assays	114
KGA	<i>Borago officinalis, Coriandrum sativum, Bombyx mori, Salvia haematodes, Centaurea behen, Santalum album, Mellisa parviflora, Lalletantia roylean, Ocimum gratissimum, Lavendula stoechas, Cheiranthus cheiri, Mathiola incana, Ambra grasea, Delphinium denudatum, Paeonia emodi, Pandanus tectorius</i>	DPPH, No assays	115
POL-10	<i>Aristolochia rotunda, Cinnamomum cassia, Emblica officinalis, Matricaria chamomile, Orchis mascula, Piper longum, Piper nigrum, Plumbago zeylanica, Terminalia bellerica, Zingiber officinale</i>	In vitro antioxidant assays	116
PHF	<i>Vitis vinifera, Phyllanthus emblica, Punica granatum, Cinnamomum cassia, Ginkgo biloba, Camellia sinensis</i>	DPPH, superoxide, and nitric oxide free radical scavenging method	117
Liu Wei Di Huang	<i>Cortex moutan, Rhizoma dioscoreae</i>	H ₂ O ₂ assay	118
Shankhpushpi	<i>Convolvulus pluricaulis, Evolvulus alsinoides, Clitoria ternatea, Canscora decussata</i>	TLC-DPPH method	119
Hyponidd	<i>Cassia auriculata, Curcuma longa, Emblica officinalis, Enicostemma littorale, Eugenia jambolana, Gymnema sylvestre, Melia azadirachta, Momordica charantia, Pterocarpus marsupium, Tinospora cordifolia</i>	Superoxide dismutase assay	120
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Trikatu megaext	<i>Piper nigrum, Piper longum, Zingiber officinale</i>	DPPH, superoxide radical assay	122

Abana	<i>Asparagus racemosus, Terminalia arjuna, Eclipta alba, Withania somnifera, Tinospora cordifolia, Centella asiatica, terminalia chebula, Glycyrrhiza glabra, Phyllanthus embelica, Boerhaavia diffusa, Convolvulus pluricaulis, Ocimum sanctum, Nardostachys jatamansi, Piper longum, Carum copticum, Zingiber officinale, Cyperus rotundus, Acorus calamus, Nepata hindostana, Embelia ribes, Syzygium aromaticum, Celastrus paniculatus, Santalum album, Elettaria cardamomum, Aloe vera, Daucus carota, foeniculum vulgare, Rosa damascena, Cinnamomum cassia, Crocus sativus, Nelumbium speciosum, Punica granatum, Pyrus malus</i>	Nitric oxide scavenging activity	123
Geriforte	<i>Achillea millefolium, Adhatoda vasica, Allium cepa, Allium sativum, Pium graveolens, Argyria speciosa, Asparagus adscendens, Asparagus racemosus, Berberis aristata, Boerhavia diffusa, Caesalpinia digyna, Capparis spinosa, Carum copticum, Cassia occidentalis, Celastrus paniculatus, Centella asiatica, Cichorium intybus, Cicer arietinum, Coriandrum sativum, Crocus sativus, Curcuma longa, Cyamopsis psoraloides, Daucus carota, Eclipta alba, Elettaria cardamomum, Emblica officinalis, Embelia ribes, Foeniculum vulgare, Glycyrrhiza glabra, Mucuna pruriens, Myristica fragrans, Phyllanthus amarus Piper longum, Psidium guyava, Raphanus sativus, Solanum nigrum, Sphaeranthus indicus, Syzgium aromaticum, Tamarix gallica, Terminalia arjuna, Terminalia chebula, Tinospora cordifolia, Tribulus terrestris, Vitis vinifera, Withania somnifera</i>	Nitric oxide scavenging activity	123
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Avaleha	<i>Hippophae rhamnoides, Emblica officinalis, Allium przewalskianum, Bidense pilosa, Centaurea depressa, Inula racemosa, Rubia cordifolia, Capparis spinosa, Ephedra gerardiana, Foeniculum vulgare, Mentha spicata, Arnebia euchroma, Bunium persicum, Ocimum sanctum, Clarified butter, Sisamum indicum, Saccharum officinalis</i>	DPPH radical assay	125
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Anti-Depressant activity			
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Siotone	<i>Withania somnifera, Ocimum sanctum, Asparagus racemosus, Tribulus terrestris, Shilajit</i>	Footshock stress induced model	134
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Punarnavashtak kwath	<i>Boerhavia diffusa, Picrorrhiza kurroa, Tinospora cordifolia, Zingiber officinalis, Berberis aristata, Terminalia chebula, A. indica, Tricosanthes dioica</i>	CCl ₄ model, HepG2 cell line	157
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Lucer	<i>Pravala pishti, Kamadudha rasa, Sutashekhara rasa, Amalaki, Godanti bhasm, Jatamansi, Mukta shukti pishti, Svarnamakshika bhasma, Shankha bhasma, Guduchi satva, Kiratatikta, Jyotishmati beeja, Parsika yavani, Vacha</i>	Aspirin, ethanol induced gastric ulcers in rats	163
Patoladi kasaya	<i>Patola, haritaki, bibhitaka, amalaki, kutaki, cirayata, amrta, pittapapada, sunthi, and bhrngaraja</i>	Peptic ulcer	164
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Avipattikar churna	<i>Terminalia bellerica Emblica officinalis Cyperus rotundus Vida lavana Embelia ribes, Amomum subulatu), Cinnamomum tamala, Syzgium aromaticum, Operculina terpepethum, Sharkara</i>	Pyloric ligations	165
PHF	<i>Aegle marmelos, Eettaria cardamomum, glycyrrhiza glabra, Citrus aurantifolia, Rosa damascene, Cissus quadrangularis, Saccharum officinarum</i>	Charcoal meal GIT transit, laxative effect in mice	166
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UL-409	<i>Glycorhiza globra, Benincasa hispida, Tinospora cordifolia, Saussurea lappa, Emblica officinalis, Santalum album, Aegle marmelos, Jasad bhasma, Zaharmohra bhasma, processed in Aloe vera, Foeniculum vulgare, Rosa da mascena</i>	HCl/Ethanol induced peptic ulcer	170
Rhinax	<i>Withania somnifera, Asparagus racemosus, Mucuna prurience, Phyllanthus Emblica, Terminalia chebula, Myristica fragrance, Glycyrrhiza glabra</i>	Aspirin, alcohol, cold-restraint stress induced ulcers	171
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CONCLUSION

In the rising countries increased cost of medicine as well as their side effects has become a great task when the public health is concerned. The scientific advancement carries with it the improvement in polyherbal formulations, through the study of various phytoconstituents and discovery of useful herbs combinations which work synergistically to produce desirable effect. Although polyherbal formulation is commonly used in many parts of the world, but scientifically it has not been explored. PHFs provide treatment of diseases in a holistic approach. The scientific advancement carries with it the improvement in Ayurvedic formulation of PHFs, through the study of various phytoconstituents and discovery of useful herbs combinations, which work synergistically to produce desirable effect. Many herbal therapies are still under *in vivo* evaluation and have not been evaluated by clinical trials. Moreover, safety evaluations such as toxicological studies have not performed. There is need of time to evaluate polyherbal formulation using scientific methods such as clinical trial, possible bioactive compounds and mechanism of action for the future world. Only with correct and rational use, PHFs can exert the best effect in human health. This review reveals the diversity of polyherbal formulation which have been using for long time traditionally as well as in dosage form.

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