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A Review of an Ayurvedic Polyherbal Formulation Mustadi Kwatha

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ABSTRACT

Mustadi Kwatha is a well-known *Ayurvedic* formulation. It is a widely prescribed drug and is used in all types of *Prameha* (Diabetes mellitus), *Mutrakrichha* (Urinary System related disease) and *Santarpanjanya Vyadhi* (disease due to over nutrition). Several studies have suggested that *Mustadi Kwatha* possesses anti-hyperlipidemic, anti- hyperglycemic and anti-oxidant activity. The present review explains the pharmacological potential of *Mustadi Kwatha.* In addition, this study investigates the pharmacological activities of each of the ingredients used in the formulation. It is believed that this review helps the researcher to further explore about this important *Ayurvedic* formulation.

Keywords: *Mustadi Kwatha,* Diabetes Mellitus, Hyperlipidemia, Obesity, Ayurvedic Polyherbal Formulation.

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INTRODUCTION

Mustadi Kwatha is a polyherbal formulation widely used in many disorders due to its various pharmacological activities. It is one of the commonly used *Ayurvedic* formulation. It was mentioned in *Ayurvedic* classics in *Charaka Samhita* and in *Bhaisajya Ratnavali*. *Acharya Charaka* has stated that regular administration of *Mustadi Kwatha* can cure all types of *Santarparjanya Vyadhi* (disease due to over nutrition).[1] In *Bhaisajya Ratnavali* it was mentioned that regular intake of 40 ml of *Mustadi Kwatha* cures all type of *Prameha* (Diabetes mellitus) and *Mutrkriicch*a (Urinary System related disease).[2] According to Acharya *Charaka*, *Mustadi Kwatha* consists of 13 medicinal herbs. However, as mentioned in *Bhaisajya Ratnavali*, this polyherbal drug consists of 9 herbs [Table 1]. Both type of formulation is mainly used in metabolic syndrome related disease. An extensive review of the ancient traditional literature and modern research revealed that the drug has numerous therapeutic actions like anti-hyperlipidemic, anti- hyperglycemic and antioxidant etc., several of which have been established scientifically, which may help the researchers to set their minds for approaching the utility, efficacy and potency of *Mustadi Kwatha*. A standard dose of *Mustadi Kwatha* is 40 to 50 ml twice a day before meals.

METHOD OF PREPARATION OF *KWATHA*

Mixture of *Yavakutta* (coarse) powder of all dry herbs is to be taken in amount of 25 grams. After adding 16 times of water to coarse powder, it should be allowed for boiling in an open mouthed container on low fire. Boiling should be continued till it reduces to one-eighth. Then after filtering, it can be given to patient in lukewarm form. Each time fresh *Kwatha* should be prepared[3]

AYURVEDIC PROPERTIES

As per the description available in Ayurveda classics, therapeutic effect of medicine depends upon certain pharmacodynamics properties of its individual ingredients. These pharmacodynamics properties are *Rasa, Guna, Veerya, Vipaka, Prabhava* etc. *Mustadi Kwatha* therapeutic effect depend upon its individual herbs pharmacodynamics properties. [Table 3]

Table 1: Ingredients of *Mustadi Kwatha* [4,5]

According to Acharya Charaka	According to Bhaisajya Ratnavali
Nagarmotha (*Cyperus rotundus* Linn.)	Nagarmotha *(Cyperus rotundus* Linn.)
Haritaki (*Terminalia chebula* Retz.)	Haritaki (*Terminalia chebula* Retz.)
Amalaki (*Emblica officinalis* Gaertn.)	Amalaki (*Emblica officinalis* Gaertn.)
Vibhitaki (*Terminalia bellirica* Roxb.)	Vibhitaki (*Terminalia bellirica* Roxb.)
Haldi ((*Curcuma longa* Linn.)	Haldi (*Curcuma longa* Linn.)
Devdaru (*Cedrus deodara* Loud.)	Devdaru (*Cedrus deodara* Loud.)
Gokhuru (Tribulus terrestris Linn.)	Murva (*Marsdenia tenacissima* Wight.)
Khadir (Acacia catechu Willd)	Lodhra (*Symplocos racemosa* Roxb.)
Neem (Azadirachta indica A. Juss)	Indravaruni (*Citrullus colocynthis* Schrad.)
Amaltas (Cassia fistula Linn.)	
Daruharidra (Berberis aristata DC)	
Vatsaka (Holarrhena antidysenterica Linn.)	
Patha (Cissampelos pareira Linn)	

CHEMICAL COMPOSITION WITH PHARMACOLOGICAL ACTIVITIES

Table 2: Ingredients of *Mustadi Kwatha* with their parts used, chemical composition and pharmacological activities.

Name of the drug	**Parts Used**	**Chemical Composition** [6,7]	**Pharmacological Activities**
Nagarmotha	Rhizome	The major constituents include cineol(+) copadiene, copaene, cyperen I&II, cyperenone, isopatchoulenone, cyperotundone, cyperol, cyperolone, Beta-cyperone, kobusone, mustakone, patchulene and β – sitosterol.	Nagarmotha has anti-diabetic, anti-diarrheal, anti-hyperlipidemic, hepatoprotective, anti-bacterial, anti-inflammatory and anti-oxidant action. [8] It also has diuretic, carminative, anthelminthic, analgesic, and antirheumatic activities.[9]
Haritaki	Fruit	It contains anthraquinone glycoside, chebulinic acid, chebulagic acid, tannic acid, terchebin, tetrachebulin, vitamin C, linoleic etc.	The main pharmacological activities of Haritaki are Antioxidant, Anticarcinogenic, Antimutagenic, radioprotective, Chemopreventive, Hepatoprotective, Cardioprotective, Antidiabetic, Antibacterial, Antifungal, Antiviral, Antiprotozoal, Anti-inflammatory, anti-arthritic activity, Anti-allergic, Hypolipidemic, hypocholesterolemic, Gastrointestinal motility improving, anti-ulcerogenic, Wound healing and Immunomodulatory.[10]
Bibhitaki	Fruit	The major constituents include fructose, galactose, glucose, Chebulagic acid, ellagic acid, gallic acid, mannitol, rhamnose, β- sitosterol, bellericanin and tannins.	It has analgesic, antioxidant, hepatoprotective, antibacterial, anticancer and immune-modulatory activities.[11]
Amalaki	Fruit	The main chemical composition of *Amalaki* are carotene, nicotinic acid, riboflavine, D-glucose, D-fructose, myoinositol and a pectin with D-galacturonic acid, D-arabinosyl, D-xylosyl, L-rhamnosyl, D-glucosyl, D-mannosyl and D-galactosyl residues, prodelphinidin tannins, polyphenolic compounds; 1,2,3,6-trigalloylglucose, terchebin, corialgin, ellagic acid, alkaloids, phyllantidine and phyllantine.	It has Anti-ageing, Antidiabetic, Anti hyperthyroid, Anticancer, Antioxidant, Nephroprotective, Hypolipidemic, Immunomodulator, Hepato protective, anticarcinogenic, Cardio protective action.[12]
Haridra	Rhizome	The major constituents include curcuminoids, desmethoxycurcumin, bidesmethoxy curcumin, phytosterols, fatty acids and polysaccharides.	*Haridra* has anti-diabetic, hepatoprotective, cardioprotective, anti-inflammatory, anti-bacterial, hypolipidemic, antioxidant, antimicrobial and anti-carcinogenic activity.[13]
Devdaru	Heartwood	It contains Essential oil from wood; Sesquiterpene, p-methylacetophenone,	*Cedrus deodara* has anti-diabetic, anti-ulcer, anti-inflammatory, anti-arthritic, anti-

		atlantone. Steam bark contain deodarin and toxifolin.	convulsant, anxiolytic, anti-microbial, anti-inflammatory, anti-viral, anti-tubercular, immunomodulatory, antioxidant and wound healing activity.[14]
Murva	Root	The major constituents include Pregnane glycoside, tenacissoides, Marsdenin, D-Cymarose, Asclepobiose, D-Canarose and Cissogenin.	It hasanti- diabetic, anti- inflammatory, immunomodulatory, antioxidant, anti- tumor, anti-pyretic, anti-carcinogenic activity.[15]
Indravaruni	Root	It contains mainly alkaloids I, II & III; choline cucurbitacin B, cucurbitains I & II, citrullonol, citrulluin, citrulluene, citrolic acid, elateridine, hexanorcucubitacin I, cucurbitacin E, citrullol, citronellal, methyleugenol, inositol etc.	Indravaruni has Hypolipidemic, hypoglycemic, anti-inflammatory, antioxidant and free radical scavenging activity.[16]
Lodhra	Bark	The major constituents is Loturine0.24%, Colloturine 0.02%, Loturidine 0.06%. It also contain symposide, epifzelechin, oxalic acid, phytosterol, oleanolic and ellagic acids.	It has hypolipidemic, anti-androgenic, anti-diabetic, anti-inflammatory, anti-oxidant, anti-ulcer, anti-angiogenic and hepatoprotective activity.[17]
Amaltas	Pulp of pods, Root Bark, Leaf and Flower	The major constituents include anthraquinones, flavonoids, flavon-3-ol derivatives, alkaloid, glycosides, tannin, saponin and terpenoids.	Amaltas has anti-inflammatory, antioxidant, antidiabetic, hypolipidemic, hepato-protective, antimicrobial, antitumor, antiulcer, antipyretics, analgesic and laxative activities.[18]
Patha	Root, Rhizome	It contains mainly Pelosine, Bebeerines, Cycleanine, Saponine. Deyamittin, Cissamine, isochondrodendrine, l-curine, menismine,, pareirine, hayatinine, bisbenzylisoquinoline and dicentrine.	It has diuretic, antidiabetic, antiasthamatic, hepatoprotective, anti-inflammatory, antioxidant, antipyretic activities.[19]
Gokharu	Fruit and Root	The major constituents include Harman, Harmine, glycosides, tannin,Volatail oil, flavonoids, flavonol, steroidal saponins, and alkaloids.	It has diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotonic, central nervous system, hepatoprotective, anti-inflammatory, analgesic, antispasmodic, anticancer, antibacterial, anthelmintic, larvicidal, and anticariogenic activities.[20]
Khadir	Bark and Kattha	The major constituents include Catechin, epicatechin, epigallocatechin, epicatechin gallate, epigallocatechin gallete rocatechin, phloroglucin, protocatechuic acid, quercetin, poriferasterol glucosides, poriferasterol, acyglucosides, lupenone, lupeol,, kaempferol and dihydrokaemferol	It has Hepatoprotective, antimicrobial, cardioprotective, hepatoprotective, Immuno modulatory, anti-inflammatory, Hypoglycaemic, antipyretic and antidiarrheal activities. [21]
Neem	Leaf, Flower, Bark and Fruit.	The major constituents include quercetin, azadirachtin, nimbin, nimbinin, nimbidin, nimbosterol 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n-hexacosanol and different amino acids.	Neem has Antioxidant, Wound healing, Anti-inflammatory, Nephroprotective, Hepatoprotective, antidiabetic, Neuroprotective, Immuno modulatory activities.[22]
Daruharidra	Root, Fruit, Steam	It contains mainly berberine, ceryl alcohol, hentriacontane, sitosterol, palmitic acid, oleic acid, tannins, flavonoids, phytosterols, saponins and glycosides.	It has Antitumour, Hypoglycemic, hypolipidemic, Antidiarrhoeal, Anti-microbial, Anti-inflammatory activities. [23]
Vatsaka	Bark, Seed	It contains numbers of steroidal alkaloids, such as conanines, 3- aminoconanines, 20-aminoconanines, 3-aminopregnans, 20-diaminopregnanes and their derivatives and others are holadysenterine, conarrhimine, isoconessimine , isoconessine etc.	It has mainly Anti-amnesic, Neuroprotective, Acetylcholinesterase, Antidiabetic, Antiurolithic, Antibacterial, Anti-inflammatory, Anti-malarial, Anti-diarrhoeal, Antimutagenic and Antihypertensive Activities.[24]

Table 3: *Ayurvedic* Properties of Ingredients of *Mustadi Kwatha* [25,26]

Drug name	***Rasa***	***Guna***	***Veerya***	***Vipaka***	***Doshakarma***
Nagarmotha	*Tikta, Katu, Kashaya*	*Laghu, Rooksha*	*Sheeta*	*Katu*	*Kaphapitta Shamaka, Deepana, Pachana, Sangrahi. Stanyakar, Lekhana, Sothahara, Jworaghna etc.*
Haritaki	*Pancharasa* except *Lavana Rasa*	*Laghu,Rooksha*	*Sheeta*	*Madhur*	*Tridoshashamaka,* especially *Vatashamaka, Kaphaghna, Srotah-Shodhana, Shothahara, Vedanasthapana, Chakshushya, Anulomana, Rasayana etc*
Bibhitaki	*Kasaya Rasa*	*Rooksha,Laghu*	*Ushna*	*Madhur*	*Tridoshashamaka,* especially *Kaphashamaka, Shothahara, Vedanasthapana, Raktastambhana, Trishnanigrahana, Chhardinigrahana, Kaphaghna, Rechana etc.*
Amalaki	*Pancharasa* except *Lavana Rasa*	*Guru, Rooksha, Sheeta*	*Sheeta*	*Madhur*	*Tridoshashamaka, especially Pittashamaka, Dahaprashamana, Chakshushya, Keshya, Medhya, Nadibalya, Rochana, Deepana, Anulomana, Garbhasthapana, Mutrala, Pramehaghna, Kushthaghna, Jwaraghna, Rasayana etc.*
Haridra	*Tikta, Katu, Kasaya*	*Rooksha, Laghu*	*Ushna*	*Katu*	*Kapha Vata Shamaka and Pitta Rechaka, Shothahar, Vedanasthapan, Varnya, Kusthagna, Vranaropana, Lekhana, Mutra Viranjniya, Pramehahara etc*
Devdaru	*Tikta, Katu, Kasaya*	*Rooksha, Laghu*	*Ushna*	*Katu*	*Kaphavatasamaka, Sothahara, Vedanasthapana, Kusthagna, Krimigna, Vranasodhana, Vranaropana, Kaphanisaraka, Pramehagna etc.*
Murva	*Tikta, Kasaya*	*Guru, Rooksha*	*Ushna*	*Katu*	*Tridoshahara, Amapachana, Anulomana, Shulaprasamana, Krimighna, Raktasodhaka, Pramehagna, Jworaghna, Kusthagna etc.*
Indravaruni	*Tikta*	*Laghu, Rooksha, Teekshna*	*Ushna*	*Katu*	*Kaphapittahara, Rechaka, Vishagna, Vamak, Krimighna, Vranasodhana, Raktasodhaka, Kaphanisaraka, Pramehagna, Jwaragna etc.*
Lodhra	*Kasaya*	*Laghu, Rooksha*	*Sheeta*	*Katu*	*Kaphapittasamaka, Kusthagna, Sothahara, Chakshushya, Raktastambhana, Varnaropana, Shonitasthapana, Stambhana, Mridurechana, Raktashosaka, Kaphaghna, Jwaraghna etc.*
Gokshura	*Madhura*	*Guru Snigdha*	*Sheeta*	*Madhura*	*Vatapitta Shamaka, Vedanasthapana, Anulomana, Raktapitta Shamaka, Ashmarinashana, Mutral, Valya etc.*
Khadir	*Tikta, Kasaya*	*Laghu, Ruksha*	*Sheeta*	*Katu*	*Kusthagna, Kaphapitta Shamaka, Sthmbhana, Krimighna, Raktaprasadak, Jworagna, Medadhatusoshana, Sothagna etc.*
Neem	*Tikta, Kasaya*	*Laghu*	*Sheeta*	*Katu*	*Kaphapitta Shamaka, Varnasodhana, Kusthagna, Dahaprashaman, Kandughna, Vedanasthapan, Krimighna, Yekritautejaka, Rkatasodhaka, Pramehahara, Jwaraghna etc.*
Amaltas	*Madhura*	*Guru, Mirdu, Snigdha*	*Sheeta*	*Madhura*	*Vatapitta Shamaka, Kaphapitta Samsodhaka, Kusthagna, Vedanasthapana, Anulomana, Mriduvirechaka, Kaphanisharaka, Raktasodhaka, Hridya, Mutrajanan Aamasodhaka etc.*
Daruharidra	*Tikta, Kasaya*	*Laghu, Rukshya*	*Ushna*	*Katu*	*Kaphapitta Shamaka, Sothahara, Vedanasthapana, Varnasodhana, Varnaropana, Yekritutejaka, Deepan, Raktasthamvaka, Jwaragna etc.*
Patha	*Tikta*	*Laghu Tikshna*	*Ushna*	*Katu*	*Tridoshasamak, Mainly Kaphapitta Shamaka. Varnaropana, Vishagna, Kusthagna, Krimigna, Raktashodhaka, Deepan, Pachana, Sothahara, Stanyashodhana etc*
Vatsaka	*Tikta, Kasaya*	*Laghu Ruksha*	*Sheeta*	*Katu*	*Kaphapittashamaka, VArnaropana, Sthambhana, Arshoghna, Sangrahik, Raktasthambaka, Jworagna, Dhatusoshana etc.*

CLINICAL STUDIES

Anti-hyperlipidemic effect

Study by Nadkarni M. A. et al. have shown that administration of *Mustadi Ghanavati* for hyperlipidemia patient decreased serum cholesterol by 22.4%, serum triglycerides by 19.6%, serum LDL by 18.2%, serum VLDL by 4.2% and increased serum HDL by 5.6%. [27] In another clinical study 40 ml of *Mustadi Kwatha* was administered to dyslipidaemia patient for 90 days. It shows that there were statistically significant improvement in biochemical parameters, such as serum cholesterol, Sr. triglycerides, Sr. LDL, and Sr. VLDL. Researcher also highlighted that there was statistically highly significant improvement in subjective parameters like *Anga Gaurava, Kshudraswasa, Angmarda, Javoparodha* and statistically significant result in *Aruchi, Atisweda, Karpaddaha, Nidraatiyoga*. [28]

Anti- diabetic effect

In one study it was reported that there was a statistically significant reducing effect ($p < 0.001$) of *Mustadi Kwatha Ghanavati* 500 mg interventions on fasting blood glucose, post prandial blood glucose, urine glucose, total-cholesterol, systolic blood pressure and diastolic blood pressure levels than placebo treatment.[29] In another study by Jayanta Kumar Sarma et al. have shown that the administration of Mustadi *Kwatha* provides significant relief in objective parameters like Fasting blood Sugar, Post Prandial blood sugar, Glycated haemoglobin (HbA1C) and in subjective parameter like *Prabhoota* and *Avila Mootrata* after 90 days of treatment.[30]

CONCLUSION

Mustadi Kwatha is a well-known *Ayurvedic* formulation which has been used since *vedic* period for the treatment of different metabolic disorders such as diabetes mellitus, hyperlipidemia, obesity etc. Trying to cure lifestyle related chronic disease with pharmaceutical medicine is like, “trying to dry out a flooded room without turning off the tap.” So it’s a time to search and explore traditional medicines which have the ability to treat lifestyle related diseases. This study contributes in exploring different pharmacodynamics and clinical expect of *Mustadi Kwatha*. After reviewing different classical *Ayurvedic* text books and scientific research papers, we can suggest that *Ayurvedic* polyherbal formulation *Mustadi Kwatha* can be used in the treatment of lifestyle related diseases.

CONFLICT OF INTEREST

There are no any conflicts of interest.

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