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THE NOVEL AYURVEDIC FORMULATIONS FOR DIABETES & KIDNEY STONE

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ABSTRACT

This research investigates the synergistic potential of two novel Ayurvedic formulations tailored for individuals with diabetes and kidney stones. The first formulation incorporates Triphala Churna, Triphala is not a single fruit, plant or herb, but rather an herbal formulation meaning three fruits. In which Amalaki (Emblica officinalis), Bibhitaki (Terminalia bellirica), and Haritaki (Terminalia chebula), renowned for its digestive and antioxidant properties, aimed at managing diabetes. The second formulation Incorporates Shigru (Moringa) Powder, which is prepared by drum stick (Moringaoleifera Lam.) leaves, known for its anti-inflammatory and diuretic properties, focusing on the prevention and alleviation of kidney stones. The study involves an extensive review of traditional Ayurvedic texts and contemporary scientific literature to elucidate the therapeutic mechanisms of Triphala Churna for diabetes management and Shigru Powder for kidney stone prevention. The study includes a comprehensive laboratory evaluation to assess the efficacy and safety of these formulations.

INTRODUCTION

Ayurveda: Ayurveda, which originated in ancient India, is a traditional medicinal practice with roots dating back to 1000 BC. It was first classified as religious or spiritual medicine, but by the 6th to 4th centuries BC, the religious healing approach had faded and it had begun to become methodically organised. Ayurveda, which translates as "science of life," integrates physical (prakriti), spiritual (purusha), and physiologic processes to establish a balanced relationship between the mind, body, and soul. The major purpose of Ayurveda is to maintain balance inside oneself between the five basic elements (Panchamahabhutas) of earth, water, fire, air, and ether or vacuum via the theory of the three life forces, or doshas. Ayurveda (Sanskrit for "knowledge of life" or "knowledge of longevity") has now gone beyond the limits of India to encompass the Indian subcontinent, Sri Lanka, Malaysia, Mauritius, South Africa, Japan, Russia, Europe, and North America. Ayurveda, at its core, strives to restore an individual's inner balance. Diet, exercise, meditation, medicines, massage, sun exposure, controlled breathing, and detoxification therapies are among the primary Ayurvedic treatments.[1, 2] Diabetes: In Ayurveda, diabetes mellitus (DM) is known as madhumeha. Diabetes is a major, noncommunicable endocrine illness of metabolic origin. Diabetes mellitus is a metabolic condition characterised by hyperglycemia caused by abnormalities in insulin secretion, insulin action, or both. Hyperglycemia, in turn, destroys many of the body's systems, resulting in diabetes complications that aggravate the diabetic condition and reduce quality of life. Diabetes

mellitus in adults is becoming more common worldwide, posing a global public health burden. It is expected that by 2030, India, China, and the United States will have the highest number of diabetics. Ayurveda, a traditional Indian medical system, has been shown to supplement therapy and manage diabetes.[3] Ayurveda and other traditional medical systems describe a variety of plants, minerals, and/or their formulations for diabetic treatment. Allopathic drugs used to treat diabetes can cause hypoglycemia, nausea, vomiting, hyponatremia, flatulence, diarrhea or constipation, alcohol flush, headache, weight gain, lactic acidosis, pernicious anemia, dyspepsia, dizziness, and joint pain. So, instead of allopathic pharmaceuticals, herbal drugs are a terrific alternative that have little to no side effects or harmful effects. Rasayana medicinal plants have been utilised for over 1000 years in Indian herbal remedies for traditional health care. Gymnema Sylvestre (Gurmar), Momordica charantia (Karela, bitter gourd), Syzygium cumini (jamun, jambul), Emblica officinalis (Amla), Azadirachta indica (Neem), Terminalia chebula (Hirda), Terminalia Bellerica (Behda), Terminalia Bellerica (Babhul), Tinospora Cardifolia (Gulvel), Ocimum Sanctum (Tulsi), Adhatoda Vasica (Adulsa), Hibiscusrosa Sinensis (Jaswand), etc are the plants used in treatment of diabetics. Asanand, Trivang Bhasma, Gokshuradi Guggul, Lohasava, Indrajav Churana, Madhumehariare theayurvedic formulation used for diabetics. [3,4,5,6,7]

Kidney stones: Kidney stones, or the production of kidney stones, are one of the oldest and most common diseases of the urinary tract. The urinary system consists of two kidneys (bean-shaped), ureters, bladder, and urethra. The kidneys are bean-shaped and positioned in the middle of the back, below the ribs. The kidneys carry water and waste from the bloodstream and turn it into urine. Nitrogenous waste, including urea, uric acid, creatinine, and other poisons, are not eliminated in the kidneys. Crystals arise when cells fail and aggregate in the body or organ. Crystals attract other elements and form a solid cluster, resulting in kidney stones. Stone development in the kidney is one of the oldest and most common medical conditions known to humans. Urinary stones consist of protein-coated inorganic and organic crystals. The most common components of urinary stones are calcium, uric acid, struvite, and ammonium acid. Calculi can vary in size and shape and can be found throughout the urinary tract, from the kidney to the bladder. Kidney stones can harm anyone, although they are more common in men, particularly among non-Hispanic white people, Overweight and obese people are likewise at a higher risk than those of normal weight. Kidney stones cause excruciating discomfort. Pain can also be caused by a kidney infection (pyelonephritis). Pain is primarily caused by moving stones from the kidneys to the ureter and bladder. This causes frequent, intense pain. Pain is an unpleasant sensory and emotional experience caused by tissue injury or harm to another type of tissue. Medicinal plants with diuretic, antispasmodic, and antioxidant properties can decrease crystallisation, nucleation, and aggregation, making them effective treatments for urolithiasis. Ayurvedic preparation for treating urolithiasis is assessed for safety and efficacy. The herbs used in the treatment for kidney stone. Camellia sinensis (green tea), Rubus idaeus (raspberry), Rubia cordifolia (common madder), Moringa Oleifera lam (drum stick/shigru), Petroselinum crispum (parsley), Punica Granatum (pomegranate), Pistacia Lentiscus (mastic), Solanum Xanthocarpum (yellow-fruit nightshade), Urtica Dioica (stinging nettle), Dolichos Biflorus (horse gram), Ammi Visnaga (khella), Nigella sativa (black-cumin), Hibiscus sabdariffa (roselle), and Origanum Vulgare (oregano) etc.[8, 9, 10, 11, 12, 13, 14]

1) Formulation for diabetes:

Triphala Churna: Triphala churna is used in treatment of diabetes mellitus. Triphala is rich in health care properties that can help people manage diabetes & other similar diseases by

inhibiting glycolytic enzyme presence of tannins which are polyphenols that bind & precipitate proteins & promotion of lower blood glucose level also inhibit & prevent glycation. In simple words,it inhibits the digestion and absorption of starch, preventing post-meal hyperglycemia an excess of sugar in the blood.

Figure 1: Triphala Churna

Composition of Triphala churna:

Triphala is not a single fruit, plant or herb, but rather an herbal formulation meaning three fruits.

A) Amla (Emblica officinalis)
B) Baheda (Terminalia bellirica)
C) Haritika(Terminalia chebula)

A) Amla:

Basic name: Indian gooseberry, Embellicmyrobalan.

Natural source: It comprises of new or dried products of Emblica officinalis.

Family: Euphorbiaceae/Phyllanthaceae.

The fruit of emblica officinalis also known as Indian gooseberry in english. It has a cooling effect that helps to balance Pitta dosha. A natural source of antioxidant It also boosts a concentrated amount of vitamin C, making it a powerful support for immune system.

Figure 2: Amla

B) Baheda: (Terminalia bellirica)

Basic name: Bahira (Sanskrit), Beleric or Bastard Myrobalan

Natural Source: Obtained from dried ready product of Terminalia belerica.

Family: Combretaceae

It is good for Kapha dosha & contains specific constituent called betasitosterol, a plant-derived phytosterol, which is known to support healthy metabolicfunctions.

Figure 3: Baheda

C. Haritika: (Terminalia chebula)

Basic name: Haritaki, Hirda, Hirdo, Harde, Black/Chebulic myrobalan. Organic Source: Obtained from develop or little products of the tree Terminalia chebula. Family: Combretaceae. It has a warming nature that supports all three dosha, especially Vata dosha. Traditionally known for its scraping & detoxifying effect. It contains beneficial constituent betasitosterol.

Figure 4: Haritika

Method of preparation of Triphala churna:

- Drugs are cleaned & dried properly.
- Drugs are kept separately & powdered.
- They are sieved using 80-mesh sieve & each one of them are powdered & weighed separately & then mixed together in suitable proportion.
- It is then kept in air tight container in cool & dry place.

2) Formulation for kidney stone:

Shigru powder:

Drumstick tree (Moringa Oleifera Lam.) member of Moringaceae family is widely spread from India to Africa & numerous other tropical & arid countries,

mainly utilized as food & medicine. Shigru (Moringa Olefera) is medicinally important plant & is used for the treatment of different diseases. Moringa Oleifera is additionally referred to as horse radish tree and drum stick tree. According to Ayurveda, when there is an imbalance in VATA DOSHA level, the body, the body's kapha composition may dry out. This can lead to kidney stone. Moringa has high Nutritional value with multi-vitamins, phytonutrients, supports low blood triglycerides & cholesterol levels beneficial for Heart, Blood circulation & healthy weight management. The leaves, bark, flowers, fruit, seeds, and root are used to make medicine.

Figure 5: Drumstick tree

Sanskrit name: Shigru
Botanical name: Moringaoleifera lam.
Family: Moringaceae
Used plant part: leaves

Formula for Triphala churna:

Sr. No.	Ingredients	Botanical name	Plant part	Quantity
1	Amla	Emblica officinalis	Fruit	1 part
2	Baheda	Terminalia bellirica	Fruit	1part
3	Haritika	Terminalia chebula	Fruit	1part

Method of preparation of Shigru powder:

1. Collection of Moringa leaves
2. Cleaning of leaves
3. Blanching (for 5 minutes)
4. Shade drying (for 6 days)
5. Grinding
6. Passes though sieve
7. Collection of powder

Evaluation tests:

A) Evaluation of Triphala churna:

The prepared Triphala churna evaluated by various parameters,

1) Organoleptic evaluation:

The various organoleptic characteristics of Triphala churna like colour, odour, taste and appearance was studied.

Sr. No.	Parameters	Result
1.	Colour	Light brown
2.	Odour	Characteristic
3.	Taste	Bitter & astringent
4.	Texture	Soft

2) Physicochemical evaluation:

Physicochemical parameters like foreign matter, moisture content, p^H, total ash, acid insoluble ash, water-soluble extractive value, alcohol soluble extractive values were evaluated.

Sr. No.	Parameters	Result
1.	Foreign matter	NIL
2.	p^H	6.2
3.	Ash value	6.9 %
4.	Acid insoluble ash	2.6 %
5.	Water soluble ash	3.5 %

3) Phytochemical test: Prepared churna was subjected to phytochemical screening to exhibit the presence or absence of various phytoconstituents as flavanoids, alkaloids, carbohydrates, glycosides, saponins, tannins, proteins etc.

S. No.	Tests	Result
1.	Molisch's test	Carbohydrates present
2.	Mayer's test	Alkaloids absent
3.	Salkowiski test	Steroid present
4.	Lead acetate test	Flavonoids present
5.	Foam test	Saponins present
6.	Ferric chloride test	Tannins present
7.	Millon's test	Proteins absent

4. Pharmaceutical Evaluation: Pharmaceutical properties like Bulk density,

Tapped density, Hausner's ratio, Carr's index and angle of repose were evaluated.

S. No.	Properties	Result
1.	Bulk density	0.65
2.	Tapped density	0.82
3.	Hausner's ratio	1.25
4.	Carr's index	20.07 %
5.	Angle of repose	31.60°

B) Evaluation of Shigru powder:

1) Organoleptic evaluation:

S. No.	Parameters	Result
1.	Colour	Greenish white
2.	Odour	Characteristic
3.	Taste	Pungent (katu)
4.	Texture	Fine

2) Physiochemical evaluation:

S. No.	Parameters	Result
1.	Ash value	10.7%
2.	p^H	6.3
3.	Acid insoluble ash	0.35%
4.	Water soluble extractive value	27.5%
5.	Alcohol soluble extractive value	20.3%

3) Phytochemical test:

Phytochemical screening of methanol extracts of prepared Shigru powder exhibits the present or absent the phytoconstituents.

Tests	Phytochemical class	Observation
Dragendroffs test	Alkaloids	Present
Shinoda test	Flavonoids	Present
Foam test	Saponins	Present
Ninhydrin test	Amino acids	Absent
Benedict's test	Reducing sugars	Present
Biuret test	Proteins	Present
Molisch's test	Carbohydrates	Present

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