



Review Article

AN AYURVEDIC APPROACH IN THE MANAGEMENT OF HYPERTHYROIDISM

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ABSTRACT

AYUSH healthcare providers are contributing a good spectrum of health care system to India and rendering relief to the health seekers of the rural as well urban area. India has very long time tradition of the use of this system. Ayurvedic system of healthcare is a big fraction of AYUSH healthcare that originated as well as developed in India.

Hyperthyroidism is a chronic, hormonal disorder that may affect almost all tissues and organs. Hyperthyroidism has been managed optimally with modern drugs since long but it may produce various untoward effects on long usage.

The aim of this review is to study the literature regarding herbal drugs that have been commonly used in Hyperthyroidism or similar symptoms. The modern as well as Ayurvedic literature was reviewed to explore herbal drugs pertaining to pharmacological effects and therapeutic benefits for hyperthyroidism. The present article is an effort to highlight the role of a plants particularly used in hyperactive thyroid gland, which have multifaceted pharmacological actions and therapeutic potential. This review may also be used for designing various clinical studies to serve the usefulness of plants in similar hormonal disorders.

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INTRODUCTION

Ayurvedic system of healthcare is a big chain of healthcare that originated as well as developed in India. It contains a very long history of their traditional usages in different diseases. *Ayurvedic* health care system is growing in all over the world as it is easily assimilated by all. Holistic approach, higher effectiveness, less adverse reactions compared to chemical compounds of modern allopathic science and better compliance are some their unique attributes that evolving good tolerance for *Ayurvedic* drugs among people. Long history of successful clinical evidences and escalation in its scientific validation are also making *Ayurvedic* system of healthcare more popular. It is a comprehensive system that not only provide cure to the diseases but also strengthen the body to endure adverse conditions during the course of disease and thereafter also.

Even though *Ayurvedic* drugs are being used by various practitioners in hyperthyroidism and similar conditions since long, there is no any

scientific documented evidence for usages of these medicines in these diseases. Controlled studies are required to prove their effectiveness. The classical text of *Ayurveda* provides huge literature on plants for the redressal of several diseases. Lots of clinical studies of different design on different of therapeutic potentials of *Ayurvedic* herbal drugs have been done. Most of them were followed standard operative procedures of clinical research and positively concluded but still thousands of species of plants are need to be explored for their different therapeutics targets.

Insulin and thyroid hormone imbalance are two most prevalent endocrine gland related conditions that is growing very fast among population. There are great challenges those are being studied for the betterment of the related diseases by using traditional remedies.

Thyroid is a small, butterfly-shaped gland in the front of the neck. It produces two hormones, triiodothyronine (T3) and thyroxine (T4). T3 and

T4 moves through the bloodstream to all parts of the body and it regulate vital functional events of the body.^[1] Hyperthyroidism/overactive thyroid make more thyroid hormones than the body needs and it can causes excessively high metabolic rate. Hyperthyroidism is a clinical syndrome characterized by hyper metabolic state that causes nervousness, anxiety, rapid heartbeat, hand tremors, excessive sweating, weight loss and difficulty sleeping.^[2,3]

As per *Ayurveda* the signs and symptoms related to thyroid diseases are compared to many diseases like *Galganda*, *Atyagni*, *Bhasmaka* and *Ati Karshya*, etc. In Hyperthyroidism the symptoms of *Pitta Vriddhi*, *Vata Vriddhi* and *Kapha Kshaya* are more prevalent. *Kapha Kshaya* produces *Kshaya* of other *Dhatu*s and *Updhatu*s.

Plants, minerals, metals, animal products and marine materials have been some important sources of medicines in *Ayurveda* since the commencement of human development. The demand for plant-based medicines is more among population due to its huge and reversible resources. The plant-based medicines are reported to be a prominent and multi factorial agent for improving health in AYUSH health care system. Plants will be potent sources for new therapeutics in future.

Natural products (active compounds) extracted from different plant parts are being studied for various biological activities. Thereafter plants with desired activities are being evaluated in various diseases of different origins. *Madhuyasti* (*Glycyrrhiza glabra*), *Sarpagandha* (*Rauvolfia serpentina*), *Shankhapushpi* (*Convolvulus pluricaulis*), *Sitaphal* (*Annona squamosa*), *Tulsi* (*Ocimum sanctum*), *Guduchi* (*Tinospora cordifolia*), *Sahajan* (*Moringa oleifera*), *Satavari* (*Asparagus racemosus*) and *Aswagandha* (*Withania somnifera*) are some popular medicinal drugs are being used in curing the hyperthyroidism as a single drug or in combination since long. A number of studies have been reported describing the different metabolites of these plants and their effects on thyroid glands. This review may be useful in discovering potential therapeutic effects of *Madhuyasti*, *Shankhapushpi*, *Guduchi*, *Satavari* and *Aswagandha* and developing new formulations.

MATERIAL AND METHODS

A comprehensive literary review was made to gather the various reference of Hyperthyroidism available in modern text for their better understanding on patho-physiological ground. The most approximate disease conditions to hyperthyroidism was also searched in *Ayurvedic* text and collected. Literary description regarding herbal plants that prescribed in similar condition was searched and reviewed. Pharmacological effects and actions of some such plants was also searched and compiled in this review.

Symptoms as per modern science found in Hyperthyroidism and similar conditions which resemble to it and found in *Ayurvedic* Literature

Thyroid hormone plays a significant role in metabolic process and if too much hormone is available in the blood circulation it raises the metabolic rate and the condition is called hyperthyroidism. A range of symptoms is found in the patients that can vary from person to person. Some common symptoms of hyperthyroidism are nervousness, increased sweating, heat intolerance, palpitations, fatigue, weight loss, tachycardia, dyspnea, weakness, leg swelling, eye signs, hyper-defecation, weight gain, menstrual irregularity and emotional lability.^[4] Trouble in sleeping, hand tremors, mood swings, goiter (an enlarged thyroid) are also presents that interfere in normal breathing and other daily activities.

On evaluation it is found that the symptoms of *Pitta vriddhi*, *Vata vriddhi* and *Kapha kshaya* are more observed in hyperthyroidism. Further *Kapha kshaya* induces *kshaya* of *Rasa*, *Mamsa*, *Meda*, *Majja* and *Sukra Dhatu*s. *Artava* is a *Updhatu* of *Rasa dhatu* so it also found to be decreased due to *Rasa kshaya* caused by *Kapha kshaya*. In this disease all the *Dhatu*s become debilitated and person becomes cachectic and suffers from syndrome of *Hritpeeda*, *Hridrava*, *Kampa*, *Shosha*, *Alpayapicheshhtaya* *Sharma*, *Sphikgreevodar Sushkata*, *Krishata*, *Shrama*, *Kesha-Nakha Prapatanam*, *Dourbalya*, *Asthi Saushirya*, *Ashaktimaithune*, *Yathochitkala-darshanam* and *Alpa Artavata*.^[5] Table no. 1 illustrates the conditions as per *Ayurveda* that are observed during the time course of disease.

Table1: Symptoms of Hyperthyroidism as per Modern science and their Ayurvedic perspective

S. N.	Symptoms	Interpretation as per Ayurveda	Dosha & Dhatu involvement
1.	Weight loss	<i>Karsya, Shosha, Krishata</i>	<i>Vata vriddhi & Kapha kshaya</i> causes <i>Rasa Kshaya</i> <i>Mamsa Kshaya</i> <i>Meda Kshaya</i>
2.	Increased appetite	<i>Atyagni, Atripti, Kshut</i>	<i>Pitta vriddhi, Vata vriddhi & Kapha kshaya</i> <i>Pitta Nanatamaja</i>
3.	Tremor	<i>Kampa, Vepanam, Vepathu</i>	<i>Vata vriddhi, Kapha kshaya, Rasa Kshaya, Vata in Snayu</i>
4.	Palpitation	<i>Hridrava, Spandana,</i>	<i>Vata vriddhi, Kapha kshaya, Rasa Kshaya</i>
5.	Insomnia	<i>Alpanidrata, Nidranasha, Prajagarana, Aswapana</i>	<i>Vata vriddhi, Pitta vriddhi Kapha kshaya</i>
6.	Excessive sweating	<i>Swedadhikya</i>	<i>Sweda vriddhi Pitta vriddhi, Pitta nantmaja, Pitta in Meda, Saman Vayu with Pitta</i>
7.	Increase of Body Temperature	<i>Ushmadhikya</i>	<i>Pitta vriddhi, Pitta Nanatmaja, Apana with Pitta, Samana Vayu with Pitta</i>
8.	Oligomenorrhoea and Amenorrhoea	<i>Yathochitkalada-rshanam, Alpatam, Rajonash</i>	<i>Vata vriddhi, Kapha kshaya Rasa Kshaya</i>
9.	Loss of libido	<i>Ashaktimainthune</i>	<i>Sukra Kshaya</i>
10.	Heat intolerance	<i>Sheeta Kamita</i>	<i>Pitta vriddhi</i>
11.	Fatigue	<i>Shrama, Glani</i>	<i>Vata vriddhi, Pitta vriddhi, Rasa Kshaya, Meda Kshaya, Sukra Kshaya</i>
12.	Weakness	<i>Dourbalya</i>	<i>Majja Kshaya, Sukra Kshaya</i>
13.	Anger	<i>Krodha</i>	<i>Pitta vriddhi, Pitta in Shira</i>
14.	Hyperacidity	<i>Amlaka</i>	<i>Pitta nantamaja</i>
15.	Pruritis	<i>Kandu</i>	<i>Sweda Vriddhi, Pitta vriddhi</i>
16.	Nervousness Irritability	<i>Arati Anavasthita-chitata</i>	<i>Vata vriddhi Vata nanatmaja</i>
17.	Burning sensation or Pyrexia	<i>Daha, Santapa, Osha, Antardaha</i>	<i>Pitta vriddhi, Kapha kshaya, Vata with Pitta, Pitta in Rakta, Asthi, Shira, Koshtha, Vata in Twak</i>
18.	Hair loss		<i>Asthi Kshaya</i>

Review on Medicinal plants useful in Hyperthyroidism and similar conditions:

Many of the indigenous medicinal plants are used in hyperthyroidism and it improves the quality of life of the patients. The therapeutic values of these drugs are due to biochemical constituents that produce desired effects on the patients and ease the daily life. Table No. 2 shows pharmacological properties, effects and functions of *Madhuyasti*, *Shankhapushpi*, *Guduchi*, *Satavari* and *Aswagandha* that are useful in hyperthyroidism.

Table 2: Pharmacological properties & functions of herbal drugs used in Hyperthyroidism and similar conditions as per *Ayurveda*

S.No.	Name of Plant	Part used	Pharmacological properties (As Per <i>Ayurveda</i>)	Pharmacological effects on <i>Dosha & Dhatu</i> (As Per <i>Ayurveda</i>)	Pharmacological function (As Per <i>Ayurveda</i>)
1.	<i>Madhuyasti</i> (<i>Glycyrrhiza glabra</i>) ^[6]	Root	<i>Madhur, Guru, Snigdha. Seeta Madhur</i>	<i>Vata shamak Pittashamak</i>	<i>Vata shamak, Pitta shamak, Rakta shamak, Balya, Varnakara, Sothahara, kshayahara, Vishanashini, Trishnapaha, Vranaghna, Daahaghna, Sukrala, Keshya, Swarya,</i>
2.	<i>Shankhapushpi</i> (<i>Convolvulus pluricaulis</i>) ^[7]	Whole plant	<i>Tikat, Madhura, Guru, Snigdha, Picchila, Seeta, Madhura</i>	<i>Vata Pittashamaka</i>	<i>Medhya Vata Pittashamaka Dahaprashamanam, Anulomaka, Manasa roghara, Balya,</i>
3.	<i>Guduchi</i> (<i>Tinospora cordifolia</i>) ^[8,9]	Stem	<i>Katu, Tikta, Kashaya, Laghu, Ushna, Madhura</i>	<i>Tridoshaghna.</i>	<i>Balya, Vayasthapana, Medhya, Vataraktahara, Dahaprashamana, Medhya.</i>
4.	<i>Satavari</i> (<i>Asparagus racemosus</i>) ^[10]	Root	<i>Madhura, Tikta. Guru, Snigdha Seeta Madhura</i>	<i>Vata Pittashamaka</i>	<i>Vata Pittashamaka, Balya, Medhya, Shoolahara, Grahi, Hridya, Rakta Pittashamaka, Shukrala, Rasayana, Cakshusya, Stanyajanana, Vyasthapana</i>
5.	<i>Aswagandha</i> (<i>Withania somnifera</i>) ^[11,12]	Root	<i>Tikta, Kashaya Snigdha Ushna Madhura</i>	<i>Vatashamaka</i>	<i>Balya, Rasayana, Vrishya, Kshyahar, Poushtika</i>

These plants give symptomatic relief, having antagonistic approach towards an etio-pathogenesis with good patient's compliance and minimum or no side effects. As per *Ayurveda*, the probable modes of action of these drugs on the patients of hyperthyroidism are summarized in Table No.3.

Table 3: Probable modes of actions of selected herbal drug on Hyperthyroidism and similar conditions as per Ayurveda

S.No.	Name of Plant	Pharmacological effects on <i>Dosha & Dushya</i> pattern of Hyperthyroidism or in similar condition (As Per Ayurveda)
1.	<i>Madhuyasti (Glycyrrhiza glabra)</i>	<i>Vata Pitta Shamaka</i> <i>Balya, Daahaghna, Kshayahara, Sukrala, Keshya</i>
2.	<i>Shankhapushpi (Convolvulus pluricaulis)</i>	<i>Vata Pitta Shamaka</i> <i>Dahaprashamanam, Nidrakara</i>
3.	<i>Guduchi (Tinospora cordifolia)</i>	<i>Tridoshaghna.</i> <i>Balya, Vayasthapana, Dahaprashamana</i>
4.	<i>Satavari (Asparagus racemosus)</i>	<i>Vata Pitta Shamaka</i> <i>Balya, Hridaya, Rakta Pitta Shamaka, Rasayana</i>
5.	<i>Aswagandha (Withania somnifera)</i>	<i>Vata Shamaka</i> <i>Balya, Rasayana, Vrishya</i>

Chemical studies of these plants have shown the presence of various bioactive compounds that have various medicinal effects on thyroid glands and other different parts of the body as well. Table No. 4 shows the effects of these plants on thyroid diseases that have been explored through various studies.

Table 4: Medicinal effects of selected herbal drug on thyroid hormonal imbalance

S.N.	Name of Plant	Pharmacological Function (As per Biochemical studies)
1.	<i>Madhuyasti (Glycyrrhiza glabra)</i>	Maintain the functions of the thyroid glands
2.	<i>Shankhapushpi (Convolvulus pluricaulis)</i>	Regulate the thyroid function. Root extracts reduces the level of T4 to T3 in L-thyroxine induced hyperthyroid mice
3.	<i>Guduchi (Tinospora cordifolia)</i>	Regulating effect on thyroid glands
4.	<i>Satavari (Asparagus racemosus)</i>	Decreases the levels of T3 and T4
5.	<i>Aswagandha (Withania somnifera)</i>	Controls the functions of thyroid gland

DISCUSSION

These drugs may be considered as good remedies for relieving symptoms of hormonal imbalance and other non-constitutional symptoms of hyperthyroidism such as fatigue, weight loss, increased appetite, hyperacidity, oligomenorrhea, amenorrhea, palpitation and weakness. It alleviates the effects related to central nervous system such as tremor, insomnia, nervousness, irritability also.

The most useful usage of these drugs is to improve weight loss, increase internal strength & immunity, reduce stress and regulate the hormonal imbalance. These drugs are important ingredient in many formulations prescribed for such situations and improve overall health and longevity.

As a pharmacological basis of Ayurvedic therapeutics, various fundamental principles are available in the text such as *Panchmahabhuta siddhanta*, *Tridosha* theory and *Guna, Rasa, Virya, Vipaka, Prabhava* etc. The action of Ayurvedic drug is mainly based on its '*Rasa*', '*Guna*', '*Veerya*', '*Vipaka*' and '*Prabhava*' individually or in collective form. It encompasses all above principals.

Madhuyasti is well renowned drug in traditional system of medicine. It is having the properties of *Madhura Rasa; Guru* and *Snigdha*

Guna; Seeta Veerya and *Madhura Vipaka*. It is having effect of *Vata Pitta Shamaka, Balya, Sothahara, Dahaghna, Sukrala* and *Rakta Pitta Shamaka* as per the classical references in Ayurvedic texts. *Ayurveda* considers it to be a *Rasayana dravya* and it is very useful in treatment of gastrointestinal, cardiovascular, central nervous system and gynecological disorders.

Its roots and rhizomes exhibits various therapeutic properties such as antiulcer, expectorant, anxiolytic activities, mild estrogenic effects, efficient brain tonic and also protect the body vitals against the oxidative stress.^[13] It is also considered as an anti stress and anabolic agent so used as health supplement also. Like adaptogen, it helps in the HPA axis function^[14] and maintains the functions of the thyroid glands.^[15]

Shankhapushpi contain *Madhura* and *Tikta Rasa; Guru* and *Snigdha Guna; Seeta Veerya; Madhur Vipaka* and *Medhya Prabhava*. It possesses *Jwara, Dahahara, Vata Pitta Shamaka* and *Nidrahara*. It is one of the most important *Medhya Rasayana* drugs in Ayurveda.

This drug shows antidepressant, cardiovascular, anxiolytic, antioxidant and neuro-

protective properties. Clinical studies exhibits that it induces a feeling of calm and peace, good sleep and a relief in anxiety, stresses, and mental fatigue. [16] Plant extract regulate the function of thyroid gland. Root extracts inhibit the level of T4 & T3 in L-thyroxine induced hyperthyroid mice. [17]

Guduchi contains *Kashaya, Tikta Rasa; Laghu Guna; Ushna Veerya* and *Madhura Vipaka*. It possesses *Tridoshaghna, Balya, Medhya Dahahara* properties. It is considered as an important herbal drug and it is used in treatment of dyspepsia, diabetes, fever, urinary problems, jaundice, chronic diarrhea, cardiac disease, dysentery, helminthiasis, skin diseases, leprosy and many more diseases. Various studies highlight the anti-toxin, anti diabetic, anticancer, immune modulatory, antioxidant, antimicrobial, hepato-protective activity. [18] It is also used as a supplement of iron and calcium and so alleviates the symptoms related to such insufficiency. The potential benefits as a therapeutic agent as well as nutritional supplements are well established. The pharmacological actions attributed to this drug in *Ayurvedic* text have evidences. [19]

Satavari is a well known *Ayurvedic rasayana* and having the properties of *Madhura Rasa; Guru Snigdha Guna; Seeta Veerya* and *Madhur Vipaka* and potent *Vata Pitta Shamaka*. It possesses *Balya, Medhya* and *Rasayana* properties. It prevents ageing, increase longevity, impart immunity, improve mental function, vigor and add vitality to the body. It is also used in nervous disorders, dyspepsia, neuropathy and ailments of liver. [20] It is much popular *Ayurvedic* rejuvenating tonic especially for the females. It exhibits useful action in menstrual irregularities.

Studies show that aqueous concentrate of the root have indicated noteworthy changes in thyroid hormone level. Its extract decreases the levels of T3 and T4 compared to the reference drug propyl thio uracil. [21]

Aswagandha contain *Kashaya, Tikta Rasa; Laghu, Snigdha Guna; Ushna Veerya* but *Madhura Vipaka*. It possesses *Rasayana, Balya, Vrishya* properties. *Ashwagandha* has been used as an anti-inflammatory, anti-oxidative, anti-anxiety, aphrodisiac, immune-modulation, CNS depressant, hepato-protective, cardiovascular protection, adaptogenic and anti-stress. [22] All these properties may ease the syndromes of hyperthyroidism.

Various studies also show that *Aswagandha* have regulating effect on thyroid glands. [23] *Ashwagandha* is used to treat various disorders of central nervous system, stress and neuro-

degenerative diseases, cerebral ischemia, general debility and hormonal disorders. The most useful usage of this drug is to reduce stress and modify the sleep.

As per Ayurvedic principles and concepts, the symptoms of Hyperthyroidism resemble the symptoms due to predominance of *Pitta Vata Dosha vriddhi* and *Dhatu Kshayatmak Lakshanas*. These drugs are having a *Rasayana* effect and *Dhatupaushtik* properties on overall body organ and alleviating *Vata Pitta vriddhi* also. All these drugs act as adaptogens that modify the stress response, nervous & hormonal system regulation and improve immune systems. These rejuvenator herbs improve health by increasing immunity, vitality and resistance, imparting longevity. The combination of all these drugs may improve the symptoms of hyperthyroidism collectively.

CONCLUSION

The demand for Ayurvedic medicines especially herbal drugs as health products to alleviate the illness and to enrich the essential nutrients of the body is growing in new world. The present article is an effort to compile the available Ayurvedic literature on herbal drugs with respect to its traditional uses in similar conditions to hyperthyroidism. Some pharmacological studies on these drugs have been also conducted in hyperthyroidism that validates the concepts of *Ayurveda* regarding to drug properties and effects. Even though the outcomes from this review may be quite hopeful for the use of these drugs as a single or poly herbal agent for Hyperthyroidism but more and more clinical controlled studies are required to prove their effectiveness.

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