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A CLINICAL STUDY OF CHAVYADI VATI IN THE MANAGEMENT OF SVARABHEDA W.S.R. TO HOARSENESS OF VOICE".

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ABSTRACT

Ayurveda, the ancient science of life can be traced back to the period of *Vedas* and is considered as distinguished science which approaches towards the best ways to live a healthy life. *Svarabheda*, the disease of *Svaravaha Srotas* can be classified under *Kanthagata Roga* as *Svaravaha Srotasa* are situated in *Kantha*. *Acharya Sushruta* has described it in *Uttar Tantra*. In modern science, the disease *Svarabheda* can be correlated with Hoarseness of Voice as both the terminologies have similar features. Aims and objectives were to study the Svarabheda roga according to Ayurvedic concept, to study the efficacy of Chavyadi vati in context of Svarabheda and to study the side effect of the drug if any. All the selected patients fulfilling the criteria were taken in single group where patients were advised to take Chavyadi vati orally. The effect of therapy was assessed by grading of sign and symptoms. In total, out of 27 patients 11 patients were completely cured, 10 patients were markedly improved and 6 patients were moderately improved.

KEYWORDS: Svarabheda, Chavyadi vati, Hoarseness of voice.

INTRODUCTION

"*Ayurveda*", the science of life, is the oldest system of medicine which is sustaining till today in our Indian culture. Though some scholars recommend *Ayurveda* as an *Upaveda* of either *Rigveda* or *Atharvaveda*,[1] but truly speaking, it is an independent science running parallel to the stream culture that is why *Maharishi Kashyap* has rightly mentioned it as the **"fifth veda"** superior to all the other Vedas.[2]

Svarabheda is commonly encountered now-a-days due to the dietary habits of taking spicy, oily food, cold beverages and cold climate. Lower & middle socio-economic group people are particularly prone as their immunity status is low. Hawkers are also prone due to excessive misuse of voice.[3] These factors coupled together results in recurrent episodes of disease. *Svarabheda* not only cripples children from majority of their enjoyable and learning movements but also makes adult's to feel uneasy, restless, difficult to communicate and even permanent hoarseness of voice if complication occurs.

In modern science, the disease *Svarabheda* can be correlated with Hoarseness of Voice as both the terminologies have similar features. H.O.V. is defined as roughness of voice resulting from variation of regularity, periodicity or intensity of consecutive sound waves.[4]

Antibiotics & steroids are the main stay in treatment of H.O.V. as far as the allopathic system of medicine is concerned. They can give temporary relief to the patient but cannot check the recurrence of the disease. Repeated administration of antibiotics & steroids may lead to many side effects in the patients. That is where Ayurvedic formulation can be of great help in giving long lasting relief and avoiding complications.

If there are indications that the patient might have to undergo surgery for vocal polyps,[5] or nodules also with the antecedent rise of post operative bleeding, anesthetic complications & respiratory problems and further more surgical procedures have its own complications also.

In *Ayurveda*, *Svarabheda* has been described as a separate disease but not under *Mukha roga*. *Acharya Charaka* has classified the disease of *Mukha* on the basis of predominance of *Doshas* but has described the *Svarabheda* in *Rajyakshama Roga* in *Chikitsa Sthana* in *Trimarmiyachikitsitam Adhyaya*.[6]

Acharya Charaka has mentioned medicinal treatment of *Mukha Roga* in *Chikitsa Sthana* in

Trimarmiyachikitsitam Ch.26 with treatment of *Svarabheda* in the same chapter. *Acharya Sushruta* has put forward the *Chikitsa* of this particular disease as oral intake of drugs having properties of *Kaphavata Shamak, Medohara, Lekhana, Shothahara, Ropana, Svarashodhaka* and *Vedana Sthapana*. He has also enumerated six type of *Svarabheda* in *Uttar-Tantra.*[7]

But as yet no such standard line of management could be made which can lessen the agony felt by the patients of *Svarabheda.* Currently in the modern era, new avenues are being explored for treating the disease, yet the disease has not been dominated. Taking the above mentioned facts in mind and to bring out patient from uneasiness, frustation, pain and to make him productive for the society, a sincere effort has been made in the present study entitled "***A Clinical study of Chavyadi vati in the Management of Svarabheda w.s.r. to Hoarseness of Voice".***

To find out the best available in *Ayurvedic* texts, the critical review of *Ayurvedic* literature was done and among many formulations, one formulation was selected *"Chavyadi vati*[8]*"* which had been made in the form of 500mg tablet. This formulation has been mentioned in almost all the *Ayurvedic* texts.

30 patients were included in the present trial into one group, and were given *Chavyadi vati* 500 mg 2 QID for chewing.

Drug Review

Svarabheda, the disease of *svaravaha srotas* or *Kantha* is well explained in every *Ayurvedic* text[9]. Although number of preparations for *Svarabheda* is given. For the present study, the trial drug *Chavyadi vati* have been selected. This drug has been mentioned in *Chakradutta, Bhaishajya Ratnavali* and *Yog Ratnakar*. The above drug has been selected from *Chakradutta* to establish the effectiveness of *Chavyadi vati* in *Svarabheda* and to prevent the complications.

Ingredients of *Chavyadi vati* [10]

1. *Chavya* (Piper retrofractum) - 1 Part
2. *Amlavetas*(Hyppophae rhamnoides)(Seabuckthorn) - 1 part
3. *Shunthi*(Ginger officinale) - 1 part
4. *Pippali*(Piper longum) -1 part
5. *Marich*(Piper nigrum) - 1 part
6. *Tintidika*(Rhus parviflora) - 1 part
7. *Talish patra* (Abies webbiana) -1 part
8. *Vanshlochana*(Bambusa pudica) - 1 part
9. *Jeerak* (Cuminum cyminum) - 1 part
10. *Chitrak moola* (Plumbago zylenica) - 1 part
11. *Laghu ela*(Elettaria cardimomum) - 1 part
12. *Tejpatra*(Cinamomum tamala) - 1 part
13. *Dalchini*(Cinamomum zeylanicum)- 1 part
14. *Gura*(Jaggery) - 13parts

Method of preparation

All the contents of *vati* were made into fine powder with the help of pulverizer and then passed through the 100 no. sieve. Powder was mixed properly. Then *gura* was melt and powder was mixed with it. Granules were made from it in *khalva yantra* and were dried well in sunlight. Tablets of 500mg were made from it in tablet forming machine. Tablets were dried and packed in dry sterile containers. They were properly sealed and finally labeled.[11]

Aims and objectives

- To study the Svarabheda roga according to Ayurvedic concept.
- To study the efficacy of Chavyadi vati in context of Svarabheda
- To study the side effect of the drug if any.

Selection of Disease

1. Svarabheda is most common disorder encountered in general practice.
2. It causes significant morbidity through sore throat and interference with communication.
3. Recurrence of the disease is very often.
4. Availability of patients in good number.

MATERIAL AND METHODS

Clinical study

Clinical study has been carried out in single trial group. 30 patients were selected from Shalakya Tantra OPD. Of R.G.G.P.G.A.C. Paprola, after obtaining their concent and 27 have completed the trial. Case study was random and patients were selected irrespective of sex, caste, religion.

Criteria for selection of patient

Inclusion criteria

1. Patients presenting with sign and symptoms of Swarabheda occurring due to non specific inflammatory condition of larynx without any complications.
2. Patients above age group of 5 years irrespective of sex, caste and religion.
3. Patients willing for the trial.
4. Ethical committee approval.

Exclusion criteria

1. Paralysis of recurrent and superior laryngeal or both nerves.
2. Tumors – Benign and malignant.
3. Congenital – Laryngeal web, cyst, laryngocele.
4. H.O.V. occurring due to specific infection e.g. Tubercular and fungal infections etc.
5. H.O.V. due to Diabetes Mellitus and Hypothyroidism.
6. Presence of other somatic or mental disorders requiring treatment.
7. Patients not willing to be registered for the trial.
8. Immune – compromised patients.

Method of study
After careful examination, 30 patients were selected from the OPD of Shalakya Tantra of R.G.G.PG Ayurvedic hospital, Paprola and treated in a single trial group.

Trial group and Trial drug
In this group Chavyadi Vati orally was given to 30 patients as a trial drug.

Mode of administration and dose of trial drug in trial group
Chavyadi Vati orally 500mg 2 tab QID as lozenges.

Duration of trial – 15 days.

Follow up – 2 follow-ups at weekly interval and 1 follow-up at the last of the month.

Instructions to the patients
All the patients were advised about pathya-apathya. The dietary and behavioural schedules advised to patients were:-
1. Complete voice rest.
2. Steam inhalation.

Criteria for assessment of results
1. Sujective
2. Objective

Grading and scoring system was adopted for assessing each symptom before the commencement of trial and after completion of trial.

Table 1: In the present research work following symptoms and signs were recorded and scoring was done as given below in table.

Sign and symptoms	0	1	2	3
Irritation of throat	No irritation in throat	Mild irritation non-continuous	Continuous but not incapacitating normal routine activity.	Continuous and incapacitating normal routine activity.
Sore throat	No pain in throat	Pain non- continuous	Continuous but not incapacitating normal routine activity.	Continuous and incapacitating normal routine activity.
Odynophagia	No pain during deglutition	Intermittent pain during deglutition	Continuous pain during deglutition	Unable to deglutinate
Dysphagia	Able to eat regular diet	Able to eat solid diet	Able to take liquids	Unable to eat and drink.
Congestion in Pharynx	No congestion	Thread like enlarged vein	Thorough congestion with pinkish mucosa	Thorough congestion with reddish mucosa.
Congestion in Larynx	No congestion	Thread like enlarged vein	Thorough congestion with pinkish mucosa	Thorough congestion with reddish mucosa.
Cough	Absent	Less oftenly	Present occasionally during eating or speaking	Usually all time
Fever	Absent	99-100F	101-102F	103-104F
Halitosis	Absent	1-5cm	5-50cm	50-75cm
Change in voice	No change	Patient himself know voice change	Patient and other person know voice change	No phonation

Objective criteria
a. Haematological examination
- Hb gm%
- T.L.C.
- D.L.C.
- E.S.R.

b. Biochemistry test
- B. Sugar (fasting)
- R.F.T.
- L.F.T.

c. Urine examination
- Routine
- Microscopic

Statistical analysis
The information gathered regarding demographic data was given in percentage. The scoring of criteria's of assessment was analyzed statistically in terms of B.T. (before treatment), A.T. (after treatment), X (B.T. – A.T.), S.D.(Standard Deviation), S.E. (Standard Error), Paired 't' test was carried out at the level of $P<0.05$ and $p<0.0001$.

Overall results were adjusted in terms of percentage relief obtained in symptoms.
- Cured - 100% relief
- Markedly improved - >75% relief
- Moderately improved - >50% - <75% relief
- Improved - >25% - <50% relief
- Unimproved - <25% relief

Effect of therapy

The efficacy of Chavyadi vati orally was studied in 27 patients on various parameters and results were derived after execution of statistical methodology. The effect of therapy on criteria assessed has been presented as under:

Table 2:

S.no.	Sign and symptoms	n	mean		X (d) BT-AT	%age relief	SD	SE	T	P
			BT	AT						
1.	**Irritation of throat**	25	1.85	0.22	1.63	88.10	0.68	0.13	12.31	<0.0001
2.	**Sore throat**	25	1.74	0.25	1.49	85.63	0.64	0.12	11.97	<0.0001
3.	**Odynophagia**	13	0.59	0.07	0.52	88.14	0.57	0.11	4.64	<0.0001
4.	**Fever**	7	0.25	0.00	0.25	100	0.44	0.08	3.01	<0.01
5.	**Halitosis**	18	0.77	0.00	0.77	100	0.64	0.12	6.31	<0.0001
6.	**Cough**	25	1.33	0.18	1.15	86.47	0.64	0.11	9.91	<0.0001
7.	**Congested pharynx**	27	2.59	0.62	1.97	76.06	0.64	0.12	15.70	<0.0001
8.	**Congested larynx**	27	2.40	0.40	2	83.33	0.39	0.07	26.49	<0.0001
9.	**Dysphagia**	5	0.25	0.07	0.18	72	0.48	0.09	1.99	>0.05
10.	**Change in voice**	27	2.48	0.44	2.04	82.26	0.51	0.09	20.45	<0.0001

Irritation of throat:- The initial score of **irritation of throat** was 1.85 which was reduced to 0.22 after treatment. The percentage relief was 88.1% which is highly significant statistically at the level of $p<0.0001$ ($t = 12.31$).

Sore throat:- The initial score of **sore throat** was 1.74 which was reduced to 0.25 after treatment. The percentage relief was 85.63% which is highly significant statistically at the level of $p<0.0001$ ($t = 11.97$).

Odynophagia:- The initial score of **Odynophagia** was 0.59 which was reduced to 0.07 after treatment. The percentage relief was 88.14% which is highly significant statistically at the level of $p<0.0001$ ($t = 4.64$).

Fever:- The initial score of **fever** before treatment was 0.25 which was reduced to 0 after treatment. The percentage relief was 100% which is significant statistically at the level of $p<0.01$($t = 3.01$).

Halitosis:- The initial score of **halitosis** was 0.77 which was reduced to 0 after treatment. The percentage relief was 100% which is highly significant statistically at the level of $p<0.0001$ ($t = 6.31$).

Cough:- The initial score of **cough** before treatment was 1.33 which was reduced to 0.18 after treatment. The percentage relief was 86.47% which is highly significant statistically at the level of $p<0.0001$ ($t = 9.91$).

Congestion over mucosa of pharyngeal wall:- The initial score of **congestion over mucosa of pharyngeal wall** was 2.59 which was reduced to 0.62 after treatment. The percentage relief was 76.06% which is highly significant statistically at the level of $p<0.0001$ ($t = 15.70$).

Congestion of Larynx:- The initial score of **congestion of larynx** was 2.40 which was reduced to 0.40 after treatment. The percentage relief was 83.33% which is highly significant statistically at the level of $p<0.0001$ ($t = 26.49$).

Dysphagia:- The initial score of **Dysphagi**a was 0.25 which was reduced to 0.07 after treatment. The percentage relief was 72% which is not significant statistically at the level of $p>0.05$ ($t = 1.99$).

Change in voice:- The initial score of **change in voice** was 2.48 which was reduced to 0.44 after treatment. The percentage relief was 82.26% which is highly significant statistically at the level of $p<0.0001$ ($t = 20.45$).

Table 3:

S.no.	Haematological findings	N	mean		X (d) BT-AT	%age relief	SD	SE	t	P
			BT	AT						
1.	Hb	27	11.09	11.40	-0.31	2.80	0.27	0.05	-5.79	<0.001
2.	TLC	27	8200	7607.4	592.6	7.23	62568	120.41	4.92	<0.001
3.	ESR	27	21.25	10.48	10.77	50.68	4.83	0.92	11.59	<0.001

In single group Chavyadi vati given orally have significant effect statistically on Hb at the level of $P<0.001$ ($t=-5.79$) and percentage improvement of 2.80%, significant effect on TLC statistically at the level of $P<0.001$ ($t=4.92$) and 7.23% improvement. Significant effect on ESR statistically at the level of $P<0.001$ ($t=11.59$) with percentage improvement of 50.68%.

OVERALL RESULT OF TREATMENT

Overall result of treatment in 27 patients of Svarabheda under trial

Sr. no.	Assessment	No. of patients	%age
1.	Cured	11	40.74
2.	Markedly improved	10	37.03
3.	Moderately improved	6	22.22
4.	Slightly improved	0	0
5.	Unimproved	0	0

11 patients were completely cured, 10 patients were markedly improved and 6 patients were moderately improved.

In total, out of 27 patients 40.74% were completely cured, 37.03% were markedly improved and 22.22% were moderately improved.

DISCUSSION

Probable mode of action

The drug formulation Chavyadi vati was selected with its valid classical reference which is described in context of chikitsa of Svarabheda.(C.D 13/6, B.R. 17/8). Major ingredient of chavyadi vati is Gura; having properties like anti-allergic, expectorant, ulcer healing, anti pyretic, anti- inflammatory, antiseptic and soothening effect. ***Gura*** is useful in haematemesis, cough, bronchitis, laryngitis, ulcers of mucous membrane and fatigue[12].

Pippali with its main component piperine alkaloid possesses antimicrobial, antipyretic, decongestant effect and immunomodulatory activities[13]. The probable mode of action of drug can be attributed to the annexed effect of the pharmacotherapeutics properties of various constituents of the trial drug. To know the mode of action of the drug it is imperative to look into the Rasa-panchaka as it is fundamental of pharmacotherapeutics of Ayurvedic management.

The disease Svarabheda occurs in Kantha pradesha in Svaravaha srotasa and is mainly due to vitiation of kapha and vata doshas. Disturbances of agni results in ama formation which by itself may culminate in various ailments. It can also be assumed that the body defence mechanism is affected or the immune system of the body is decreased.

Chavyadi vati is having 50% vatahara, 39.29% of kaphahara and 10.71% of pittahara Dravya. It is having dominance of *katu rasa* 42.86%, *madhura rasa 28.57%*, *laghu guna 41*.18%, *ruksha* 26.47%, *ushna virya* 78.57%, *katu vipaka* 50%, and *dosha karma* of *vatahara* 50%, *Kaphahara* 39.29% and total *vatakapha shamaka 71.43%* which can pacify vitiated *vata* & *kapha doshas* responsible for the disease. The oral use of this drug produces *dipan pachan* effects as *katu, tikta* & *ushna* properties improves *Jatharagni.* The *lekhana* properties of drugs will cleanse the channels and thus relieves the *srotorodha*. The disease accompanied by change in voice and pain due to vitiation of *vata dosha* which is pacified by *dosha karma* of *vata hara* 50%.

- ***Talish Patra*** is indicated in *Svarabheda, kasa* and diseases of throat[14]. *chavya, shunthi, marich, pippali, chitraka* are in *shoolprashaman mahakashaya*[15] *which reduces the pain* by their *vatashamaka* effect.
- ***Chitraka*** *is in lekhaniya maha-kashaya* and clears the channels by removing *kapha.*[16]
- ***Pippali*** is in *Urdhabhaghahar, Shirovirechan(Su.) Jvarghna, Vedanahara, Aampachana, Kasaghna,*[17] *Rasayana.*

Apart from these facts the constituents of the combination also have potentially proven pharmacological actions like anti-inflammatory, anti pyretic, antibacterial, decongestant, analgesic, smoothening effect, mucolytic and ulcer healing context which can counteract various signs and symptoms of the disease. Thus the above description regarding the pharmacotherapeutic properties of trial drugs proves their action in *Svarabheda* for its cure and preventions. In classical terms, it can be interpreted that *madhura, katu rasa laghu, ruksha, tikshna guna, ushna virya, katu vipak* and *vatakaphaghna* properties of drugs are responsible to break the *samprapti* of *Svarabheda*.

According to different Ayurvedic texts these drugs are also having properties mentioned against each other which may play a role to break the *samprapti* of *Svarabheda*.

SUMMARY & CONCLUSION

a. Maximum numbers of patients were of age group >55 years (25.93%), 62.96% were males (62.96%), (66.67%) registered patients were married. Maximum patients registered were *Hindu*(96.3%), maximum number of patients were residents of rural area (81.48%), students (29.63%), belonged to lower middle class (55.56%), (37.03%) were higher secondary qualified and most the patients used to take mixed diet (55.56%).

b. Majority of the patients were having no addiction (29.63%). Another all have some sort of addiction. Majority of patients had *vata kaphaja prakriti* (48.15%) with *avara satva (*44.44%), *madhyama sara (*44.44%), *madhyama samhanana* (66.67%), *madhyam satmya (*44.44%) and *madhyama vyayam shati* (55.56). Maximum number of patients i.e.

9(33.33%) complained of excessive speaking as an aggravating factor. 100% patients have acute laryngitis.

c. Out of 27 patients under trial irritation of throat was observed in 92.59% patients, sore throat in 92.59%, odynophagia in 48.15% patients, fever in 25.93% patients, halitosis in 66.67% patients, cough in 92.59% patients, congested mucosa in pharyngeal wall in 100% patients, congestion in larynx in 100% patients, dysphagia in 18.52% patients and change in voice in 100% patients.

2. The results showed that therapy provided significant relief. In Irritation of throat there was 88.1%relief, in sore throat there was 85.63% relief, in odynophagia there was 88.14% relief, in fever there was 100%relief, in halitosis there was 100% relief, in cough there was 86.47% relief, in congestion over mucosa of pharyngeal wall there was 76.06%relief, in congestion in larynx there was 83.33% relief, in change in voice there was 82.26% relief which are also statistically highly significant, except in dysphagia there was 72% relief which was not statistically significant.
3. Results shows that therapy provided significant relief in fever and highly significant relief in other symptoms except in dysphagia.
4. The result of drug on H.O.V. occuring due to nonspecific laryngitis was satisfactory. The drug is *ushna virya, katu* & *madhura rasa, laghu guna, katu vipaka* and *vatakapha shamaka* capable of breaking the samprapti of *Svarabheda.*
5. Drug has high healing rates, cost effectiveness and have no side effects, except; **A single adverse effect of the trial drug was observed during the course of trial only in the patients of hemorrhoids and that was mild bleeding per anum.**

Scope on the subject:-of further research work

This clinical trial was a sincere attempt in small number of patients in limited time and requires further work-up on large number. Although the present clinical study gave satisfactory results to researcher and again strengthens my belief in the fundamentals of *Ayurveda*, few humble recommendations are forwarded in this respect.

1. Culture and sensitivity should be carried out to know the effect of drug on various pathogens.
2. Drug Analysis could be a further ameliorative step.
3. Initial encouraging results should be critically verified on a large sample size so that an ideal mode of *Ayurvedic* treatment of laryngitis can be established.

REFERENCES

1. Agnivesha pranita Charaka Samhita ayurveddipika vyakhya vidyotini commentary by Sri Pandit Kashinath shastri, published by dr. Gangasahay pandey and vaidya Yadavji trikamji Acharya, purvardha, Chaukhamba Sanskrit sansthan, Varanasi, sutrasthana, 2004; 30/21: 447.
2. Vridhajivakaya Kashyap Samhita commentary by Nepalraj Pd. Hemraj Sharma and written by ayurvedaalankar Sri satyapal, Chaukhamba Sanskrit sansthan, Varanasi, Upodhghat, Ayurveda paricheda, 2005; 3.
3. Johns MM, Sataloff RT, Merati AL, Rosen CA (August). "Shortfalls of the American Academy of Otolaryngology-Head and Neck Surgery's Clinical practice guideline: Hoarseness (Dysphonia)". *Otolaryngology–Head and Neck Surgery*, 2010; 143(2): 175–7.
4. Donna S. Lundy, Roy R. Casiano. Diagnosis and Management of Hoarseness, Hospital Physician, October 1999; 59-69.
5. Hochman II, leitels SM. Phonomicrosurgical management the International Association of Logopedics and of vocal fold polyps: The subepithelial microflap resection Phoniatrics. *Logopedics and Ph oniatrics,* Issues for Future technique. *Journal* of *Voice*, 2000; 14: 112-8.
6. Agnivesha pranita Charaka Samhita ayurveddipika vyakhya vidyotini commentary by Sri Pandit Kashinath shastri, published by dr. Gangasahay pandey and vaidya Yadavji trikamji Acharya, uttarardha, Chaukhamba Sanskrit sansthan, Varanasi, chikitsasthana, 2004; 8/16: 279.
7. Sushruta Samhita "Ayurvedtattvasandipika" by Kaviraja Ambikadutta Shastri, Chaukhamba Sanskrit sansthan, Varanasi, uttattantra, 2011; 53/1: 500.
8. Sri chakrapani krit Chakradutta "Vaidyaprabha" commentary by Dr. Indradev tripathi and published by Acharya Ramanath dwedi, Chaukhamba Sanskrit santhan, Varanasi, Swarabheda chikitsa, 13/6: 111.
9. Sushruta Samhita "Ayurvedtattvasandipika" by Kaviraja Ambikadutta Shastri, Chaukhamba Sanskrit sansthan, Varanasi, Nidanasthana, 2011; 16/48: 388.
10. Bhaishajyaratnavali by Kaviraj Govind Das Sen "Siddhiprada" commentary by Prof. Siddhinandan Misrha, Chaukhamba subharti prakashana, Varanasi, Swarabhedarogadhikara, 17/8: 471.
11. Srichakrapani krita Chakradutt Vaidyaprabha Hindi commentary by Dr. Indradeva Tripathi, Chaukhamba Sanskrit Sansthana, Varanasi, Svarabheda chikitsa, 111.
12. Sushruta Samhita "Ayurvedtattvasandipika" by Kaviraja Ambikadutta Shastri, Chaukhamba Sanskrit sansthan, Varanasi, Sutrasthana, 2011; 45/160-162: 234.
13. Bhavaprakasha of Sribhava Misra edited by Sri Brahamasankara Misra and Sri Rupalalaji Vaisya, Chaukhambha Sanskrit Bhavan, Bhavaprakash Nighantu, Haritakiyadi varga, 2007; 55-58: 15.
14. Ayurvedic Pharmacopoeia of India, part- I, vol.-IV, Government of India ministry of health and family welfare, department of Ayush, 142.
15. Agnivesha Charaka Samhita, vidyotani tika edited by Pt. Kashinath pandey and Dr. Gorakhnath

chaturvedi; Chaukhamba bharti prakashna, Varanasi, Purvardha, Sutrasthana, 2009; 4/45: 68.
16. Agnivesha Charaka Samhita, vidyotani tika edited by Pt. Kashinath pandey and Dr. Gorakhnath chaturvedi; Chaukhamba bharti prakashna, Varanasi, Purvardha, Sutrasthana, 2009; 4/3: 60.
17. Agnivesha Charaka Samhita, vidyotani tika edited by Pt. Kashinath pandey and Dr. Gorakhnath chaturvedi; Chaukhamba bharti prakashna, Varanasi, Purvardha, Sutrasthana, 2009; 4/36: 66.