https://doi.org/10.47552/ijam.v16i1.5360 ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 16 (1), 2025; 130-135

Evaluation of efficacy of *Dhoopana* (polyherbal nasal fumigation) versus polyherbal steam inhalation in children with *Pratishyaya* (rhinitis): A pilot study

Research Article

Monika[1*], Renu B Rathi[2], Bharat Rathi[3], Deepthi Balakrishnana[4]

1. Ph.D. Scholar, 2. Professor & H.O.D, Department of Kaumarabhritya; 3.Professor, Department of RSBK, Mahatma Gandhi Ayurveda Medical College, Hospital & Research Centre, Salod (H), Wardha (Maharashtra). India.
4. Professor & H.O.D, Dept. of Kaumarabhritya, PNNM Ayurveda Medical College, Cheruthuruthy, Kerala, India.

Abstract

Background: According to Ayurveda, *Pratishyaya* is characterized by the continuous outward flow of *Vata, Pitta*, and *Kapha* from the nostrils, resembling rhinitis, where the nasal mucosa becomes inflamed due to infection, allergy, or injury. The study aims to evaluate the efficacy of polyherbal steam inhalation versus nasal fumigation *(Dhoopana)* in children with rhinitis. Material and methods: Randomized reference controlled open label equivalence pilot study. Patients after initial screening were subjected to randomization and were included in two groups; Group C (Control group) and Group T (Trial group). 10 subjects in each group. Group C (Control group) Polyherbal steam inhalation, *Arka* prepared from *Tulsi, Nirgundi, Vasa* and *Nilgiri* were used for steam inhalation. Group T (Trial group) *Dhoopana* (Polyherbal nasal fumigation). *Dhoomvarti* prepared from dry leaves of *Tulsi,Nirgundi*, *Vasa* and *Nilgiri*. Results: From the observations of the clinical trial, it can be concluded that efficacy of *Dhoopana* (polyherbal fumigation) is better as compare to polyherbal steam inhalation. Statistically significant difference is seen in objective criteria of nasal patency and symptoms of nasal itching and coughing whereas no significant difference is observed in symptoms rhinorrhoea, nasal obstruction, headache and anorexia. Conclusion: Rhinitis in acute stage is one of the frequently troubling conditions in children, though many medicines are available in the market in every system of medicine for its management, but it is difficult to administer them orally in pediatric population. Polyherbal *Dhoopana* (Nasal Fumigation) is safe and easy to administer, so, can be used in general pediatric practice in patients suffering from acute condition of rhinitis.

Keywords: *Ayurvedic treatment, Dhoopana,* Inflammatory response, Pediatric rhinitis, Polyherbal steam inhalation, Therapeutic efficacy.

Introduction

As per Ayurveda, *Pratishyaya* (rhinitis) is one among *Nasagata Roga* (nasal disorders) in which *Kaphadi Doshas*(principal constituents of the body) are continuously eliminated through the nose. These vitiated *Doshas* get accumulated in the head and their further movement towards the nose causes *Pratishyaya*. According to Acharya Charaka, Definition of *Pratishyaya* is *"Pratikshnamshyayatiitipratishyaya"* means continuous outward movement of *Vata, Pitta and Kapha doshas* from nostrils is *Pratishyaya*.(1) *Pratishyaya* is classified into 5 types as *Vataja, Pittaja, Kaphaja, Sannipataja and RaktajaPratishyaya*.(2) Similar clinical presentation of *Pratishyaya* can be seen in Rhinitis. In rhinitis, nasal mucosa gets inflamed due to any infection, allergy or injury.(3) The prevalence of non-allergic rhinitis is about 40%.(4) The prevalence of allergic rhinitis in India was reported "11.3% in children aged 6-7 years and 24.4 % in children aged 13-14 years. (5) Acharya Videha explained clinical presentation of *Pratisyaya* as Excessive secretions from nasal cavity and eyes, fever, generalized weakness with severe headache. (6) Nasal mucosae have rich blood supply, stimulation of sympathetic nervous system causes vasoconstriction which further result in shrinkage of nasal mucosa on the other side, stimulation of parasympathetic system is responsible for excessive secretion from the nasal mucosa along with dilatation of local vessels. Emotional disturbance also plays a significant role as autonomic nervous system supply of nasal mucosa is under the control of hypothalamus. If no any treatment is given at early stage it may get complicated and further lead to other comorbid conditions like chronic rhinitis, cough, or breathing difficulty with debility.(7) There is no use of Antibiotics in acute rhinitis.(8) Antihistamine–decongestants are frequently used in cough and cold. But in some studies, these were not found effective in the management of rhinitis.(9) There is limited data regarding safety of Pseudoephedrine 4 and phenylephrine in rhinitis.(10) Various Ayurveda interventions are mentioned in Ayurveda classics as protocol for the management of *Pratishyaya*, out of which *Dhoopana* is one of the interventions, could effectively manage the disease.

*** Corresponding Author:**
Monika
PhD Scholar Department of Kaumarbhritya.
MGACH&RC, Salod, Wardha,
Maharashtra, India, Pin code-442001
Email Id: ayurmonika@gmail.com

Dhoopana is a natural way to sterilize the environment; Fumes generated from various herbs works through their antimicrobial properties. *Dhoopana* is also having therapeutic benefits and used in various disorders like Fever, cough, cold, headache, wound healing and epilepsy. Many *Dhoopana* drugs are excellent environmental cleansers but present study focuses on *Pratishyaya* (Rhinitis), Inflammation of the nasal cavity. The aim of the study is to test the efficacy of *Dhoopana* (Polyherbal nasal fumigation) versus Polyherbal steam inhalation in children with *Pratishyaya* (Rhinitis).

Materials and methods

Study type and study design: Randomized reference controlled open label equivalence pilot study

Population:

- Inclusion criteria: • Patients of either sex aged between 7 to 14 years. Patients suffering from common cold, presenting with features of *Pratishyaya* (Rhinitis) for 7-10days. Patients willing and able to participate in the study.
- Exclusion criteria: • Patients suffering from common cold for more than 10days. Patients with Chronic Allergic Rhinitis, *Dushta Pratishyaya, Raktaja Pratishyaya, Sannipataja Pratishyaya* and Infectious diseases like T.B. Patients suffering from Cleft Palate, Deviated nasal septum and Nasal Polyps. History of hypersensitivity to the trial drug or any of its ingredients.

Place of study/source of data: O.P. and I.P. Department of Kaumarabhritya, Mahatma Gandhi Ayurveda College and Hospital Wardha

Sample size:10 children in each group.

Sample selection technique: Computer generated random number table.

Drug: The trial drugs i.e., *Dhoopanavarti* and *Arka* were prepared in *Rasa Shastra* lab of Mahatma Gandhi Ayurveda college Hospital and Research Centre.

Grouping and Posology: Patients after initial screening were subjected to randomization and were included in two groups; Group C (Control group) and Group T (Trial group).

- **Group C (Control group) Polyherbal steam inhalation:** *Arka* prepared from *Tulsi, Nirgundi, Vasa* and *Nilgiri*. In mild symptoms, 2.5 ml *Arka* was added in 500ml of water for 1minute steam inhalation and in case of moderate to severe symptoms, 5ml *Arka* was added in 500ml of water for steam inhalation for 1.5minute.
- **Group T (Trial group) *Dhoopana* (Polyherbal nasal fumigation):** *Dhoomvarti* (fumigation stick) was prepared from the powder of dry leaves of *Tulsi, Nirgundi, Vasa and Nilgiri*. At the time of administration, *Dhoomvarti* was dipped in cow ghee then it was ignited using matchbox, after few seconds it was extinguished and then its fumes were instilled through nasal route. Nasal fumigation was given for 1 minute in mild symptoms and for 1.5 minutes in moderate to severe *Pratishyaya*.

Treatment period: 7 days, twice daily, once in morning and evening. Assessment on 1st, 3rd, 5th and 7th day.

Follow up period: 14 days after the treatment period.

Outcome: Outcome of the study was assessed using subjective and objective criteria.

Subjective criteria: Sign and symptoms of *Pratishyaya* (Rhinitis) by using TNSS (Total Nasal Symptom Score).

Table 1: TNSS (Total Nasal Symptom Score)

Symptom	0 (None)	1 (Mild)	2 (Moderate)	3 (Severe)
Nasal Congestion	No congestion	Occasional, minimal	Frequent, noticeable	Constant, severe
Rhinorrhea (Runny Nose)	No discharge	Occasional, minimal	Frequent, moderate	Constant, profuse
Sneezing	No sneezing	Occasional, mild	Frequent, moderate	Severe, persistent
Nasal Itching	No itching	Occasional, mild	Frequent, moderate	Severe, bothersome

Total TNSS Score = Sum of individual symptom scores (Range: **0-12**).
Higher scores indicate more severe rhinitis symptoms.

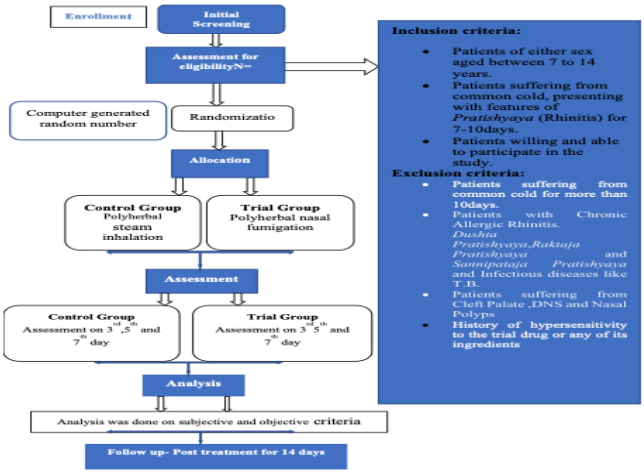
Objective criteria: Assessment of nasal blockage by using modified cold spatula test.

Statistical analysis: The data underwent analysis employing suitable descriptive and inferential statistical methods. Quantitative variables were analyzed by the "Student t-test" whereas the Chi-square test was employed for subjective parameters.

Ethical Consideration- The study was approved by Ethics Committee of MGACHRC

Consort flow chart is as follows:

Figure No. 1: CONSORT Flow chart



https://doi.org/10.47552/ijam.v16i1.5360 ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 16 (1), 2025; 130-135

Observations and Results

Weight characteristics

In the control group (N=10), the mean weight is 24.30 with a standard deviation of 7.13 and a standard error mean of 2.25. In the experimental group (N=10), the mean weight is 21.00 with a standard deviation of 6.21 and a standard error mean of 1.96. A t-test was conducted to compare the means of weight between the control and experimental groups, resulting in a t-value of 1.103 and a p-value of 0.285. The p-value suggests that there is no statistically significant difference in weight between the two groups.

Height characteristics

In the control group (N=10), the mean height is 138.40 with a standard deviation of 14.03 and a standard error mean of 4.43. In the experimental group (N=10), the mean height is 137.40 with a standard deviation of 12.86 and a standard error mean of 4.06. A t-test was conducted to compare the means of height between the control and experimental groups, resulting in a t-value of 0.16 and a p-value of 0.87. The p-value suggests that there is no statistically significant difference in height between the two groups.

Prakriti (body constitution)

- *Pitta-Kapha*: There is 1 individual in the control group and 1 individual in the experimental group. This represents 10.0% of the experimental group and 5.0% of the control group.
- *Vata-Kapha*: There are 7 individuals in both the control and experimental groups, accounting for 70.0% of each group.
- *Vata-Pitta*: There are 3 individuals in the control group and 2 individuals in the experimental group, making up 30.0% of the control group and 20.0% of the experimental group. Overall, they represent 25.0% of the total sample.

Interpretation

Both before and after treatment, there is no significant association between rhinorrhoea grades and group membership. In other words, the distribution of rhinorrhoea grades does not differ significantly between the control and experimental groups before and after treatment. Detail in Table No.1 and Figure No.2.

Table 2: Comparative evaluation of Rhinorrhoea severity Control against Experimental on basis of TNSS grading scale

		Before treatment		After treatment	
Parameters		**Control- frequency**	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Rhinorrhoea	Grade Zero	10.0%	0.0%	70.0%	90.0%
	Grade One	50.0%	70.0%	20.0%	10.0%
	Grade Two	30.0%	30.0%	10.0%	0.0%
	Grade Three	10.0%	0.0%	-	-
	Chi square value	2.333		1.583	
	P value	0.506		0.453	
		Before treatment		**After treatment**	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Nasal Itching	Grade Zero	20%	20%		
	Grade One	70%	80%		
	Grade Two	10%	10%		
	Chi square value	1.067		NA	
	P value	0.58		NA	
		Before treatment		**After treatment**	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Nasal obstruction	Grade Zero	10.0%	0.0%	70%	80%
	Grade One	70.0%	60.0%	30%	20%
	Grade Two	20.0%	40.0%	-	-
	Chi square value	1.744		0.267	
	P value	0.4182		0.606	
		Before treatment		**After treatment**	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Sneezing	Grade Zero	10.0%	10.0%	30.0%	60.0%
	Grade One	50.0%	80.0%	70.0%	40.0%
	Grade Two	40.0%	10.0%	-	-
	Chi square value	2.492		1.818	
	P value	0.288		0.178	
		Before treatment		**After treatment**	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Cough	Grade Zero	40.0%	10.0%	70.0%	100.0%
	Grade One	40.0%	70.0%	30.0%	0.0%
	Grade Two	20.0%	20.0%	-	-
	Chi square value	2.618		3.529	
	P value	0.27		0.06	

		Before treatment		After treatment	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Headache severity	Grade Zero	30.0%	60.0%	90.0%	90.0%
	Grade One	60.0%	30.0%	10.0%	10.0%
	Grade Two	10.0%	10.0%	-	-
	Chi square value	2		0	
	P value	0.368		1	
		Before treatment		**After treatment**	
		Control- frequency	**Experimental- frequency**	**Control- frequency**	**Experimental- frequency**
Anorexia severity	Grade Zero	60.0%	60.0%	80.0%	100.0%
	Grade One	40.0%	40.0%	20.0%	0.0%
	Chi square value	0		2.22	
	P value	1		0.13	

Nostril size (mm square)								
			Mean	**N**	**Std. Deviation**	**Std. Error Mean**	**T-test**	**P-value**
Control	Rt nostril (mm square)	Before	436.6000	10	97.53427	30.84304	-4.19509	0.002324
		After	602.0000	10	118.85752	37.58605		
	Lt nostril	Before	465.8000	10	145.37140	45.97047	-5.04374	0.000696
		After	760.0000	10	156.42677	49.46649		
	Total (mm square)	Before	857.0000	10	217.72409	68.85040	-5.5309	<0.01
		After	1362.0000	10	227.06044	71.80282		
Experimental	Rt nostril (mm square)	Before	472.0000	10	118.38919	37.43795	-3.8776	0.004
		After	631.2000	10	149.44995	47.26023		
	Lt nostril	Before	442.0000	10	137.96296	43.62772	-4.01241	0.003
		After	657.6000	10	96.64965	30.56330		
	Total (mm square)	Before	919.6000	10	234.76097	74.23794	-5.042	0.000698
		After	1288.8000	10	185.21147	58.56901		

Follow up

Post treatment follow was taken for the next 14 days in two visits and no any recurrence of rhinitis was noted in all the 20 patients. No any side effect was noted in both the groups.

Discussion

The disease *Pratishyaya* is very common in Pediatric population, many medicines are available for its management but no any standardized Ayurvedic therapy is available which can be given locally in nostrils in its acute stage. So, this study was planned to work upon acute rhinitis. Local fumigation and steam inhalation are simple and fast effective as compare to oral medication.

Kashyapa Samhita is mainly devoted to *Kaumarbhritya* branch (Ayurvedic Pediatrics) of *Ashtanga Ayurveda* and *Dhoopana* is described in the treatment protocol of *Pratishyaya.*(11) In this mode, various herbs are made into a stick known as *Varti* and its fumes are used for local fumigation of the affected area. It can be considered as an ayurvedic therapy that delivers the medicines directly into the airways which provide relief and protection to the local regions. (12)

Discussion on mode of Action of drugs

In *Pratishyaya,* treatment should be aimed to relieve the *Avarodha* (obstruction) created by the *Dosha.* Drugs having *Ushna* (hot) and *Tikshna* (pungent) Properties are indicated in *Dhoopana. Tulsi(Ocimum tenuiflorum* L.), *Nirgundi (Vitex negundo L.), Vasa (Justicia adhatoda* L.*) and Nilgiri (Eucalyptus obliqua* L'Hér.*)* are popular *Dhoop dravyas* (material for fumigation) for Respiratory problems. (13) *Dhoopana karma* has *Rukshana* properties because of which it is helpful in nasal discharge and cough. Fumes of these herbs may help in relieving the sign and symptoms of *Pratishyaya* due to their *Ushna Virya* (hot potency) and *Kapha Vata Shamak* (*Dosha* relieving) properties. (14) *Vasa (Justicia adhatoda* L.*)* is known effective in Respiratory tract related disorders. It may help in combating Feverish sensation present in *Pratishyaya* due to its *Kapha Pitta Shamak* and *Jwaraghana* (antifebrile) Properties. (15) Moreover, in one recent In-silico study, Phytochemicals of *Nirgundi, Vasa* and *Nilgiri* were found effective against protein targets of Covid-19. (16) Due to its *Ushna* (hot) and *Tikshna* (pungent) properties and ability to reach minute *Srotasa* (channels of the body) it is beneficial in nasal obstruction, sneezing, headache and anorexia. Hence, these four herbs have proven efficacy for steam inhalation. (17)

There is a vast description of *Tulsi (Ocimum tenuiflorum* L.) in all the ayurvedic classics in respiratory disorders. *Tulsi* along with curing viral, bacterial, fungal infections gives relief from congestion and helps in smoother breathing. It has antiallergic, antibacterial, antifungal, disinfectant properties. A study shows that *Tulsi* given in the form of aerosol through nebulization is highly efficient. (18). *Neem* (*Azadirachta indica* Juss.) is also frequently employed as one of the primary constituents in most formulations of *Dhoopana.*(19) Azadirachtin, found in Neem seed oil, has been shown to have insecticidal effects. In a study, Staphylococcus aureus showed a high level of inhibition to the fumes of *Azadirachta Indica* L., with a

https://doi.org/10.47552/ijam.v16i1.5360 ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 16 (1), 2025; 130-135

maximum of 90% inhibition in 10 minutes and 50% in 5 minutes.(20)

Discussion on results

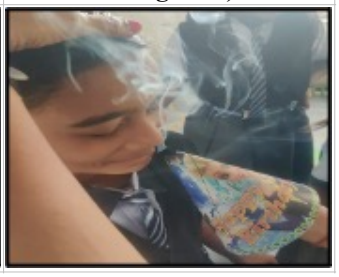
Rhinorrhoea of grade zero was present in 5% patients before treatment which then improved to 80% patients; this shows significant improvement in rhinorrhoea. Nasal itching of grade zero was present in 20% patients before treatment which then improved to 100% patients after treatment. Nasal obstruction of grade zero was present in 5% patients before treatment which then improved to 75% patients after treatment. Sneezing of grade zero was present in 10% patients before treatment which then improved to 45% patients after treatment. Cough of grade zero was present in 25% patients before treatment which then improved to 85% patients after treatment. Headache of grade zero was present in 55% patients before treatment which then improved to 90% patients after treatment. Anorexia of grade zero was present in 60% patients before treatment which then improved to 90%.

Figure 2: Raw drug for preparation of *Dhoopanavarti*

Figure 3: *Dhoopana varti*

Figure 4: Mist formation over cold spatula mirror

Figure 5: Procedure of *Dhoopana* (nasal fumigation)



Conclusion

Polyherbal *Dhoopana* (Nasal Fumigation) is safe and more effective over Polyherbal steam inhalation, so, can be used in general pediatric practice in patients suffering from acute condition of rhinitis. It is concluded that the intervention had a notable impact on removing nasal blockage and increasing nasal patency during rhinitis, as indicated by the significant differences in measurements before and after the intervention in both groups. Further large-scale studies can be more resourceful in drawing fruitful results.

Acknowledgement

I would like to extent my gratitude to the entire department of Kaumarabhritya and Rasa shastra, Mahatma Gandhi Ayurveda College and Hospital Wardha for constantly supporting and guiding me to carry out the study work.

Conflict of Interest: Nil

Funding: Self-funded

References

1. Shastry KA, Sushruta Samhita of Acharya Sushruta, Uttaratantra 24/4. 11th edition, Varanasi; Chowkambha Sanskrit Sansthana 1997, Vol- 2., p. 118
2. Acharya YT. Agnivesha Charaka samhita Chakrapanidattavirachita Ayurvedadipika vyakhyana hindi, Chikitsasthana 26/ 105-106. 1st edition Varanasi; Chowkambha Sanskrit samsthana, 1970, p.654.
3. Shyamal K. Fundamentals of Ear, Nose, Throat disease and Head-Neck Surgery 6th edition, New Delhi; published by Mahendranath Paul, The newbook stall, 1996, p. 215-216.
4. Bansal M. Diseases of Ear, Nose, Throat 1st edition context in the Nose and Paranasal sinuses, New Delhi; Published by Jaypee Brothers medical Publishers, 2013, p.322.
5. Singh S, Sharma BB, Salvi S et al. Allergic rhinitis, rhinoconjunctivitis, and eczema: prevalence and associated factors in children, Clin Respir J. 2018; 12: 547-556.
6. Shastry KA, Sushruta Samhita of Acharya Sushruta, Uttaratantra 24/5. 11th edition, Varanasi; Chowkambha Sanskrit Sansthan, 1997, vol- 2.p.118
7. Shastry KA, Sushruta Samhita of Acharya Sushruta, Uttaratantra 24/16. 11th edition, Varanasi; Chowkambha Sanskrit Sansthan, 1997, vol- 2.p.120
8. Kenealy T, Arroll B. Antibiotics for the common cold and acute purulent rhinitis. Cochrane Database Syst Rev 2013;6. Art. No. CD000247:1–60)
9. Sutter AI, Lemiengre M, Campbell H, Mackinnon HF. Antihistamines for the common cold. Cochrane Database Syst. Rev. 2003; 3: CD001267.
10. Roberge RJ, Hirani KH, Rowland PL, Berkeley R, Krenzelok EP. Dextro methorphan and pseudoephedrine-induced agitated psychosis and ataxia: case report. J. Emerg. Med. 1999; 17: 285–8
11. Bhattacharyya S. Kashyapa Samhita with Hindi Commentary Vidyotini, Reprint Edition, Chikitsa Sthana, Pratishyaya chikitsadhyaya, Verse No 12, Chaukhamba Sanskrit Series, Varanasi, 2015, Page No.195.
12. Shastry KA, Sushruta Samhita of Acharya Sushruta, Uttaratantra 24/16. 11th edition, Varanasi; Chowkambha Sanskrit Sansthan, 2001; 23(3): 253.
13. Renu R, Bharat R. COVID 19 pandemic and preventive footsteps. Int J Ayu Pharm Chem. 2020; 12(3) :100- 106
14. Cohen MM. Tulsi - Ocimum sanctum: A herb for all reasons. J Ayurveda Integr Med. 2014 Oct-Dec;5(4):251-9
15. Sawant B, Prajapati A, Mishra D, Alwe J. Pharmacotherapeutic activity of Ancient Indian Medicinal Plant with special reference to *Mishraka*

Gana (Panchtikta) in relation to Vasa (Adhatodavasica Nees.). J AyuInt Med Sci. 2022;7(1):171-176

16. Gowrishankar S, Muthumanickam S, Kamaladevi A, Karthika C, Jothi R, Boomi P, Maniazhagu D, Pandian SK. Promising phytochemicals of traditional Indian herbal steam inhalation therapy to combat COVID-19 - An in -silico study. Food Chem Toxicol. 2021 Feb; 148:111966. doi: 10.1016/j.fct.2020.111966. Epub 2021 Jan 4. PMID: 33412235; PMCID: PMC7780060
17. Rathi B, Rathi R, Khobragade P. Relevance of Ayurveda antiviral herbal wisdom from the perspective of current research. Int J Res Pharm Sci.2020;21(2): 75-183
18. Ahmed N, Kajaria D. Evaluating Clinical Efficacy of Tulsi Aerosol in the Management of Upper Respiratory Tract Infection W.s.r To Pratishyaya-A Pilot Study. 2019; 8(3): 804-814
19. Rathi RB, Rathi BJ, Bhutada RS, Dasar D, Khatana R. Review on Role of Dhoopana in the prevention of airborne infections (COVID-19). International Journal of Research in Pharmaceutical Sciences. 2020:246-52.
20. Xie YS, Fields, Isman MB. Repellency and toxicity of Azadirachtin and Neem concentrates to three stored–product beetles. J. Econ. Entomol., 1995;88:1024-1031.

*****