



ORIGINAL RESEARCH PAPER

Ayurveda

TO EVALUATE THE EFFICACY OF KUKA COUGH LOZENGES VARIANTS IN THE PATIENT SUFFERING WITH KASA (ACUTE COUGH AND THROAT IRRITATION)”

KEY WORDS: Kuka cough lozenges, Cough, Kasa, Throat irritation.

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ABSTRACT

Kasa or cough is a condition of coughing. It is a disease itself & also occurs associate with other disease conditions like common cold, flu, respiratory tract infection etc. Kuka cough lozenges is an Ayurvedic proprietary medicine from Multani Pharmaceuticals Ltd. It contains potent & well described ingredients i.e. Tulsi (*Ocimum sanctum*), Vasaka (*Adhatoda vasica*), Pudina (*Mentha arvensis*), as its active ingredients. The subjects were enrolled, and informed consent was taken. The subjects were instructed regarding the study procedure and follow up visits. The subjects were advised to take Kuka Cough Lozenges for 3 days. All the subjects were informed regarding the investigation that will be carried out during the period of the study. Kuka Cough Lozenges is helpful in the management Kasa (Acute cough and throat irritation) in human. There were no adverse effects either reported or observed during the clinical study.

INTRODUCTION

Kasa or Cough is a condition of coughing. It is a disease itself and also occurs in association with other disease conditions like common cold, flu, respiratory tract infections etc. In Ayurvedic literature Kasa is described in a separate chapter, details description of its causing factors, pathogenesis, classification, clinical features, complications, treatment lines, medications like single herbs, herbal compounds, herbomineral formulations are described. Kuka cough lozenges are Ayurvedic proprietary medicines from Multani Pharmaceuticals Ltd. Among active ingredients *Pudina Satva* (*Menthol*), *Nilgiri Taila* (*Eucalyptus oil*), *Yashtimadhu* (*Glycyrrhiza glabra*) *Vasa* (*Adhatoda vasica*) and *Tulsi* (*Ocimum sanctum*) are same for all the variants. Variations are only as per the name of the variants as *Pudina* (*Mentha piperata*) in KCL *Tulsi* mint, *Lemon* (*Citrus medica*) in KCL *Tulsi* lemon, *Ginger* (*Zingiber officinale*) in KCL *Tulsi* ginger and *Narangi* (*Citrus reticulata*) in KCL *Tulsi* orange. In a preliminary study the formulations were found effective in Kasa (cough). The present study has been planned to re-evaluate the effect of the same on acute cough & throat irritation. As per the above said objectives the randomized parallel groups clinical trials has been planned.

MATERIALS AND METHODS

The subjects were enrolled, and informed consent was taken. The subjects were instructed regarding the study procedure and follow up visits. The subjects were advised to take Kuka Cough Lozenges for 3 days. All the subjects were informed regarding the investigation that will be carried out during the period of the study.

Clinical Evaluations:

The efficacy of Kuka Cough Lozenges was evaluated based on the verbal category descriptive (VCD) scale scores.

In case of occurrence of adverse effect and /or serious adverse effect, investigators were instructed to report the same to the sponsor and Institutional Review Board within 24

hours from the time of occurrence of the adverse effect and or serious adverse effect.

STUDY DESIGN

The study was an Open labelled, Single armed, Single Centric, Interventional study. Subjects were advised to take Kuka Cough Lozenges four times a day for 3 days.

SELECTION OF STUDY POPULATION

Subjects between the age group of 18 years to 65 years (both inclusive) were selected for the trial. Individuals will be considered as those who do not have any acute medical condition or chronic medical/surgical condition that requires either immediate or continuous medical monitoring or treatment.

STUDY OBJECTIVES

Primary Objectives:

The aim of the study is to evaluate the efficacy of Kuka cough lozenges variants in the conditions of Kasa (acute cough and throat irritation).

Secondary Objectives:

To evaluate and compare the effect of all the intervention on the parameters and recurrence of the disease condition during follow up. To observe and analyze any adverse event occurs during trial duration and follow up to evaluate the safety of the trail drugs.

Investigational Plan

In order to evaluate the effect of Kuka Cough Lozenges, subjects aged between 18 to 65 years were enrolled into the study.

Number Of Groups: 4 (30 patients in each group)

Group A: Kuka Cough Lozenges (*Tulsi* mint)

Group B: Kuka Cough Lozenges (*Tulsi* ginger)

Group C: Kuka Cough Lozenges (*Tulsi* lemon)

Group D: Kuka Cough Lozenges (*Tulsi* orange)

Dose: 1 lozenge Q.I.D for 3 days

The subjects were advised to take one Kuka Cough Lozenge, four times a day for a period of 3 days.

Any noticeable adverse effects were noted down. The subjects were free to withdraw from the study if they so desired. No other medication intended for same use as study medication was allowed for these subjects. Laboratory investigations were performed on Day 1. Clinical parameters were assessed at Day 1, Day 2, Day 3 and Day 8.

Inclusion Criteria

Males and females between 18 and 65 years of age with a history of acute cough due to any cause except those listed in exclusion criteria and throat irritation for <1 week duration, who will be able to comply with the study requirements, had a cough score of 0, 1 or 2 during day time (as per Day Time Cough Scale described under end points), and willing and able to provide signed ICF prior to study will be included in the study.

Exclusion Criteria

- Participants with a history of acute lower respiratory tract infections such as pneumonia, bronchitis whooping cough, chronic obstructive pulmonary disease/asthma, tuberculosis, systemic bacterial infections for which specific drug therapy will be required;
- Any underlying lung pathology such as lung abscess or cystic fibrosis, individuals with a history of myocardial infarction within 4 weeks prior to enrollment;
- Individuals with a history of Parkinson's disease and who were on monoamine oxidase inhibitors.
- Individuals with any psychiatric illness which may impair the ability to provide written ICF.
- Individuals participating in any other clinical trial.
- Pregnant or lactating females.
- Those who were under study treatment or any other condition due to which individuals were deemed unsuitable by the investigator for reason(s) not specifically stated in the exclusion criteria will be excluded.
- Alcohol, smoke, and drug abusers will be excluded.

Test Product

Kuka Cough Lozenges in four variants:

- *Tulsi* mint
- *Tulsi* ginger
- *Tulsi* lemon
- *Tulsi* orange

Test Product And Dosage

Kuka Cough Lozenges-

prepared by Multani Pharmaceuticals Ltd.,

Dose: 1 Kuka cough lozenge four times a day for a period of 3 days.

Dosage Form: Lozenges (orally)

Product(s) Detail

Composition of Kuka Cough Lozenges				
S. No.		Ingredients (Extract)	Latin name	Part used
1.	Tulsi mint (flavour – Pudina oil)	Pudina Satva	Mentha arvensis	Leaf extract
		Nilgiri tailam	Eucalyptus globulus	Leaf oil
		Yashtimadhu	Glycyrrhiza glabra	Root
		Vasaka	Adhatoda vasika	Leaf
		Tulsi	Ocimum sanctum	Leaf
		Pudina	Mentha piperata	Leaf

2.	Tulsi Lemon (flavour – lemon oil, pineapple)	Pudina Satva	Mentha arvensis	Leaf extract
		Nilgiri tailam	Eucalyptus globulus	Leaf oil
		Yashtimadhu	Glycyrrhiza glabra	Root
		Vasaka	Adhatoda vasika	Leaf
		Tulsi	Ocimum sanctum	Leaf
3.	Tulsi Ginger (flavour – Ginger oil, Lemon oil)	Lemon	Citrus medica	Fruit juice
		Pudina Satva	Mentha arvensis	Leaf extract
		Nilgiri tailam	Eucalyptus globulus	Leaf oil
		Yashtimadhu	Glycyrrhiza glabra	Root
		Vasaka	Adhatoda vasika	Leaf
4.	Tulsi Orange (flavour – Orange oil, Orange oil 10 fold)	Tulsi	Ocimum sanctum	Leaf
		Ginger	Zingiber officinale	Rhizome
		Narangi	Citrus raticulata	Fruit
		Pudina Satva	Mentha arvensis	Leaf extract
		Nilgiri tailam	Eucalyptus globulus	Leaf oil

Blinding

This study was an open labeled single armed study of 120 subjects with acute cough and throat irritation. The subjects were divided into four groups with 30 subjects in each group.

Statistical Methods

Data are presented as mean ± SD and were compared using the paired student's *t* test between before treatment & after treatment and one-way ANOVA with " Bonferroni's Multiple Comparison Test" post-test with 95% CI. A *P* value of < 0.05 was considered significant. Data Comparison were made from Day 1 (Before Treatment; BT) to Day 2 (After Treatment; AT) & Day 3 (After Treatment; AT) and between Day 1 (Before Treatment) & Day 8 (After Follow up; AF) Data were analysed using Prism 5.0 software (GraphPad, San Diego, CA).

OBSERVATION AND RESULTS

Primary Endpoints were: 1. Day time Cough Scale, 2. Night Time Cough Scale, 3. Changes in Throat Irritation.

Secondary Endpoints Were: 1. Time to Relief, 2. Duration of Relief, 3. Drowsiness Scale, 4. Global Assessment Scale.

Group A: Kuka Cough Lozenges (*Tulsi* mint)

Group B: Kuka Cough Lozenges (*Tulsi* ginger)

Group C: Kuka Cough Lozenges (*Tulsi* lemon)

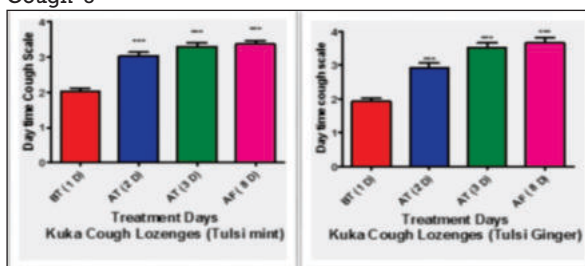
Group D: Kuka Cough Lozenges (*Tulsi* orange)

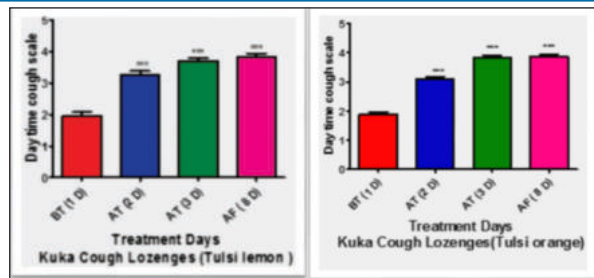
Dose: 1 lozenge Q.I.D for 3 days

Effect of Kuka Cough Lozenges on Group A: Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D:(Tulsi orange)

Day time Cough Scale – 0 to 5

Very high-0; Severe-1; Moderate-2; Mild -3; Negligible- 4; Nil Cough-5

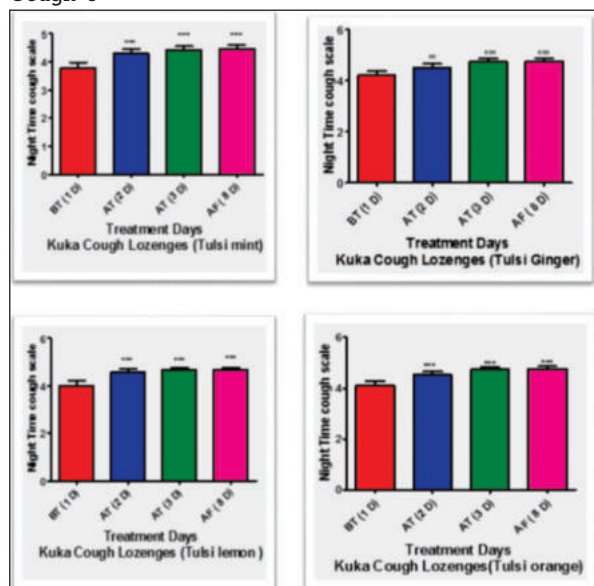




Efficacy of Kuka Cough Lozenges Group A: (Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D: (Tulsi orange) in the management in the patient suffering with Kasa (Acute cough and throat irritation) is analysed between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment. Day time Cough is found to be significantly reduced ($p < 0.05$) at 2nd & 3rd day of treatment in all the groups. Further, there is non-significant difference in the Day time Cough between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups.

Night time Cough Scale – 0 to 5

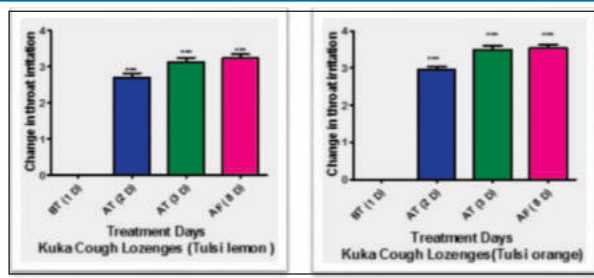
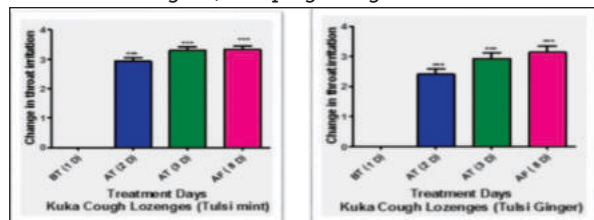
Very high-0; Severe-1; Moderate-2; Mild -3; Negligible- 4; Nil Cough-5



Efficacy of Kuka Cough Lozenges Group A: (Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D: (Tulsi orange) in the management in the patient suffering with Kasa (Acute cough and throat irritation) is analysed between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment. Night Time Cough is found to be significantly reduced ($p < 0.05$) at 2nd & 3rd day of treatment in all the groups. Further, there is non-significant difference in the Night Time Cough between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups.

Change in Throat Irritation Scale – 0 to 4

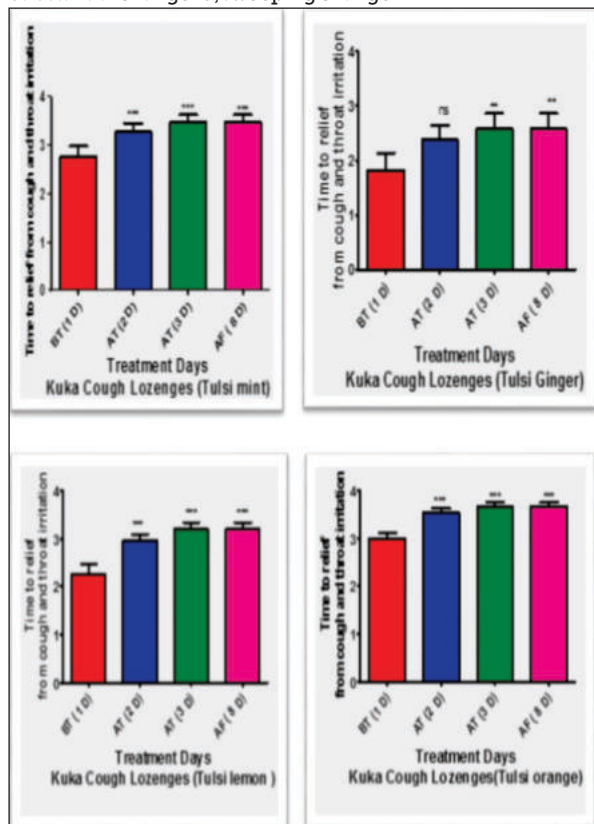
No change -0; Mild change -1; Moderate change -2; Substantial change -3; sweeping change- 4



Efficacy of Kuka Cough Lozenges Group A: (Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D: (Tulsi orange) in the management in the patient suffering with Kasa (Acute cough and throat irritation) is analysed between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment. Throat irritation is found to be significantly reduced ($p < 0.05$) at 2nd & 3rd day of treatment in all the groups. Further, there is non-significant difference in the Throat irritation was observed between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups.

Time To Relief From Cough And Throat Irritation Scale – 0 To 4

No change -0; Mild change -1; Moderate change -2; Substantial change -3; sweeping change- 4

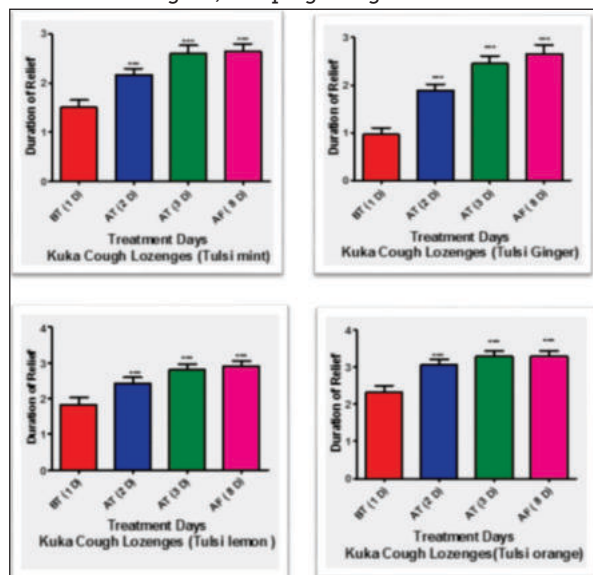


Efficacy of Kuka Cough Lozenges Group A: (Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D: (Tulsi orange) in the management in the patient suffering with Kasa (Acute cough and throat irritation) is analysed between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment.

Time to Relief from cough & throat irritation is found to be significantly reduced ($p < 0.05$) at 2nd & 3rd day of treatment in all the groups except Group B treated with Tulsi ginger. Further, there is non-significant difference in the Time to Relief from cough & throat irritation was observed between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups.

Duration of Relief Scale-0 to 4

No change -0; Mild change -1; Moderate change -2; Substantial change -3; sweeping change -4



Efficacy of Kuka Cough Lozenges Group A: (Tulsi mint); Group B (Tulsi ginger); Group C Tulsi lemon) and Group D: (Tulsi orange) in the management in the patient suffering with Kasa (Acute cough and throat irritation) is analysed between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment. Duration of Relief is found to be significantly reduced ($p < 0.05$) at 2nd & 3rd day of treatment in all the groups. Further, there is non-significant difference in the Duration of Relief was observed between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups.

DISCUSSION:

All the four variants of Kuka Cough lozenges is a polyherbal Ayurvedic formulation which contains herbs that have been proven effective in acute cough and throat irritation.

Pudina Satva (Mentha arvensis) is *Kapha-jwaraghna* and *Kanthy*¹, *Nilgiri tailam (Eucalyptus globules)* is *Kaphahara*². *Tulsi (Ocimum sanctum)* is *Kasa-swashara*³, comes from the Lamiaceae family and each part of the plant has proven to offer protection against various diseases; the aqueous and alcoholic extract from the leaves have various pharmacological activities such as anti-inflammatory, antipyretic, analgesic, antiasthmatic, antiemetic, antidiabetic, hepatoprotective, hypotensive, hypolipidemic, and antistress agents. Further, distillation of the leaves yields oil of the plant which is known to possess antibacterial, antioxidant, and anti-inflammatory properties and is used extensively in the pharmaceutical industry mainly for skin cream preparations.⁴ It has the property to mobilize mucus and remove cough from the lungs and nasal passage hence it is widely used in many herbal preparations; it is also used to cure sore throat.⁵ The Ayurvedic Pharmacopoeia of India recommends the use of the leaf and seed in rhinitis and influenza. Major components of the essential oil are eugenol, carvacrol, nerol and eugenolmethylether. Leaves have been reported to contain ursolic acid, apigenin, luteolin, apigenin-7-O-glucuronide, luteolin-7O-glucuronide, orientin and molludistin. *Vasa*⁶ (*Adhatoda vasica*) is *Kasahara*, *Kaphanisaraka*⁷, an expectorant (used in bronchial, asthmatic and pulmonary affections), antispasmodic, febrifuge, also as bronchodilatory and expectorant. The chief quinazoline alkaloid vasicine is reported in all parts of the plant, the highest being in inflorescence. It is a bitter bronchodilator, respiratory stimulant, hypotensive, cardiac depressant, uterotonic and abortifacient. Vasicinone exhibited smoothmuscle- relaxant properties of airways. *Yastimadhu*⁸ (*Glycyrrhiza glabra*) is

*Swarya, Kantha-doshahara*⁹, main action is demulcent, expectorant, anti-allergic, anti-inflammatory, spasmolytic, mild laxative, anti-stress, anti-depressive, antiulcer, liver protective, estrogenic, emmenagogue, antidiabetic. Used in bronchitis, dry cough, respiratory infections, catarrh, tuberculosis; genitourinary diseases, urinary tract infections; abdominal pain, gastric and duodenal ulcers, inflamed stomach, mouth ulcer. Also used for adrenocorticoid insufficiency. One of its main uses is in catarrh of the upper respiratory tract and gastric, duodenal ulcers. *Pudina*¹⁰ (*Mentha piperata*) it is digestive, carminative, chloretic, antispasmodic, diuretic, antiemetic, mild sedative, diaphoretic, antiseptic, antiviral, used in many mixtures of indigestion and colic and cough and cold remedies. Used for the respiratory tract and inflammation of the oral mucosa indicates its use for irritable bowel syndrome, coughs and colds. Externally, it is used for coughs and colds, rheumatic complaints, pruritus, urticaria, and pain in irritable skin conditions. The essential oil has both antibacterial and antifungal properties. Lemon (*Citrus medica*) is *Kanthy*¹¹, Ginger (*Zingiber officinale*) is *Kasa-swastishayayhara*¹², *Narangi (Citrus raticulata)* is *Kanthy*¹³.

CONCLUSION:

All the range of Kuka Cough Lozenges i.e., Tulsi mint, Tulsi ginger, Tulsi lemon and Tulsi orange is effectively control and reduce the Day time Cough, Night time cough and throat irritation between before treatment (BT 1 D) at 1 day and After Treatment (AT 2 D & AT 3 D) at 2nd day & 3rd day of treatment. Further, there is non-significant difference in the Day time Cough, Night time cough and throat irritation were observed between after treatment (AT 3 D) at 3rd day and at follow up day (AF 8D) at 8th day in all the groups. Further there is no observation of drowsiness during the treatment period. Duration of Relief from cough and throat irritation were also significantly improved in all the group of treatment. Based on the statistical analysis of on clinical data on Efficacy of Kuka Cough Lozenges Tulsi mint Tulsi ginger, Tulsi lemon, Tulsi orange is helpful in the management Kasa (Acute cough and throat irritation) in human. There were no adverse effects either reported or observed during the clinical study.

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