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Standardization of Adulsa extract, Mint extract and Basil extract based liquid jaggery lozenges

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Abstract:

The present investigation entitled "Standardization of Adulsa extract, Mint extract and Basil extract based liquid jaggery lozenges" was conducted at Food Engineering department, College of Food Technology,V.N.M.K.V. Parbhani. In this study, jaggery lozenges in various proportion of adulsa extract, mint extract and basil extract were prepared and tested for sensory evaluation.Traditional medical practitioners frequently use medicinalherbs-based formulations to cure different aliments. The soothing agents such as lozenges gives relief from sore throat. Ayurveda reveals use of herbs such as adulsa, mint and basil etc. act as a soothing agent in soreness of throat. lozenges are usually used to treat cough and sore throat they are slowly dissolve in the mouth to stop the cough and provide soothing effect on sore throat and extracts added due to its phytochemical superiority and excellent organoleptic properties. Mint extracts enhance sensory profile of the lozenges. The presence of phytochemicals makes lozenges rich in therapeutic value and replacing sugar with liquid jaggery is a healthier option.

Introduction:

In the modern world, throat infections are the most prevalent illness. Unfortunately, individuals do not take it as seriously as they do other health problems. Lead-time throat infections

can worsen into serious issues with the throat, such as pharyngitis and malignancy. (Mishra et al., 2017).

Indian traditional medicine is regarded to be the oldest system of medicine ever documented, and in some cases, it is thought to be more effective than Western therapies. Most people concur that Ayurveda, which first emerged around 900 B.E., is the oldest medical treatise in existence. The word Ayurveda derives from the Sanskrit words Ayur, which means life, and Veda, which means science. Thus, the name Ayurveda literally translates as "life science." (Ramya, 2021).*Adhatoda vasica,* commonly referred to as Vasaka in Ayurveda, belongs to the family *Acanthaceae*. Adulsa leaves are frequently used to treat chest and respiratory illnesses in Ayurvedic medicine.(Maikhuri and Gangwar,1993). Vasicine and vasicinone, two significant alkaloids, are present in the leaves. (Huq et al., 1967). *Ocimum sanctum*, sometimes known as tulsi, is a common plant in India. The fragrant plant belongs to the Lamiaceae family. Tulsi, known as the "queen of herbs," is regarded as being crucial to our daily existence. The most common houseplant in India, it is revered in the Hindu religion. (Bhowmik et al., 2010).Hinduism holds tulsi in high regard, and it is well-liked across India. Tulsi is a Sanskrit term that translates as "incorporable one" or "matchless one," respectively. (Jain, 2015). Tulsi includes bioactive substances such methyl chavicol (15–27%), linalool (30–40%), and eugenol (8–30%). Delta-cadinene, 3-carene, alpha-humulene, citral, and trans-caryophyllene are less common constituents of basil oil. (Zhelijazkov et al., 2008). *Mentha piperita* (Mentha, or mint) belongs to the *Lamiaceae* family and has been used commercially in a variety of fields, including food, medicine, and ornamental uses. (Nieto, 2017). Peppermint extract is a type of herbal extract made from Mentha piperita, or peppermint leaves. Its two main constituents are menthol (40.7% of the extract's contents) and menthone (23.4%). Peppermint oil is frequently used as a flavouring in foods and beverages (Khanal,2019).

The use of jaggery is highly valued in Indian culture. Jaggery consumption offers a number of health benefits. It is well known that jaggery is a natural sweetener and the greatest alternative to sugar. Clarified sugarcane juice is then condensed to produce the semi-liquid product known as Liquid Jaggery. Liquid jaggery has been employed in several ayurvedic medicines from the beginning of time (Singh et al., 2013).

Lozenges are solid medications meant to dissolve or disintegrate gradually in the mouth. They frequently have one or more drugs in a flavored, sugary base. They are used as slow-release therapies to keep the medication level in the mouth stable and to saturate the throat tissues with the drug solution (Mishra et al., 2017).For the treatment of coughs and sore throats, various lozenges are often utilized. Lozenges dissolve gradually in the mouth to stop coughing, ease sore throats, and provide a soothing effect(Kumar et al., 2019).

Methodology:

The present investigation was carried out inDepartment of Food Engineering, College of FoodTechnology, VNMKV, Parbhani during year2022-2023. Fresh adulasa leaves were obtained from the Dept ofBotany, College of Agriculture, VNMKV, Parbhani. Otherraw materials like liquid jaggery, basil leaves and mint leaves were procured from the localmarket.

Standardization of formulation for the preparation of liquid jaggery lozenges:

For standardizationof formula, various combination presented in Table 1 weretried and acceptable product were selected for furtherutilization. Jaggery were added with basil extract, adulsa extract, mint extract, liquid glucose and guar gumand prepare hard crack consistency.

Table1. Standardization of process and recipe formulation of jaggery lozenges:

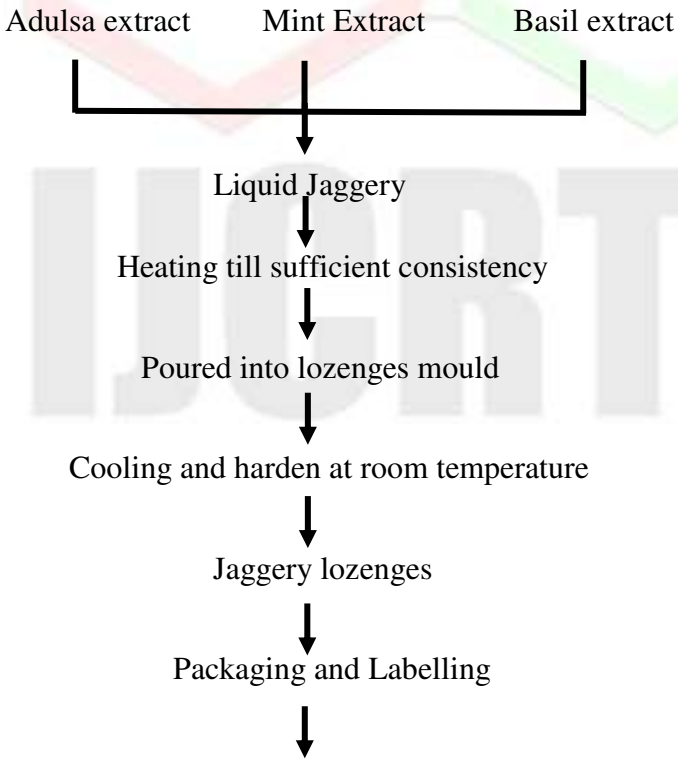
Sample	Liquid jaggery	Tulsi extract	Mint extract	Adulsa extract	Liquid glucose	Guar gum
Control(T_0)	90	-	-	-	9.8	0.2
T_1	90	1	1	0.1	9.8	0.2
T_2	90	2	2	0.2	9.8	0.2
T_3	90	3	3	0.3	9.8	0.2
T_4	90	4	4	0.4	9.8	0.2

Methodology for preparation of jaggery lozenges:

All of the ingredients were combined according to the suggested proportions to make the jaggery lozenges. The liquid jaggery served as the foundation for the jaggery lozenges, which also contained different amounts of basil extract, adulsa extract, and mint extract. Liquid jaggery, liquid glucose, gaur gum, tulsi extract, adulsa extract, and mint extract were combined to create the formulation. The mixture was continuously mixed and subjected to a drop test while being heated to 110°C. The preparation was then removed from the heat and poured into a lozenge-shaped mold. The mold was then left to cool and solidify at room temperature. After cooling, the hard lozenges were covered with powdered sugar to prevent sticking in humid environments.

The control sample (T_0) was prepared by using liquid jaggery, guar gum and liquid glucose as a base, while other samples prepared by using different proportion of basil leaves extract, adulsa leaves extract and mint leaves extract. Different trials were taken by changing the ratios of basil leaves extract (1%, 2%, 3% and 4%), adulsa leaves extract(0.1 %, 0.2 %, 0.3% and 0.4%) and mint leaves extract (1%, 2%, 3% and 4%) were used as given in table . and then jaggery lozenges were prepared and packed in HDPEpouches and sealed and stored properly in clean and dry place.

Methodology for preparation of jaggery lozenges:



Storage at ambient temperature

Flow sheet 1: Methodology for preparation of jaggery lozenges

Fig.1 Hard candy square shaped lozenges

Sensory evaluation of prepared jaggery lozenges using different concentration of basil, adulsa and mint extract:

The organoleptic evaluation of jaggery lozenges was carried out by a ten semi trained panel and the scores were given by evaluating colour and appearance, flavor, texture, taste and overall acceptability which was compared with control sample.

Table 2: Sensory evaluation of jaggery lozenges:

Sensory attributes						
Sr. no	**sample**	**Colour and appearance**	**Flavor**	**Texture**	**Taste**	**Overall acceptability**
1	CL(T_0)	9.0	8.0	8.1	8.9	8.9
2	T_1	8.0	8.2	8.0	8.1	7.5
3	T_2	8.1	8.0	7.9	8.1	7.6
4	**T_3**	**8.6**	**8.4**	**7.9**	**8.6**	**8.2**
5	T_4	7.6	7.0	7.1	7.8	7.0
6	SE	0.059	0.048	0.056	0.082	0.057
7	CD@5%	0.180	0.146	0.169	0.250	0.172

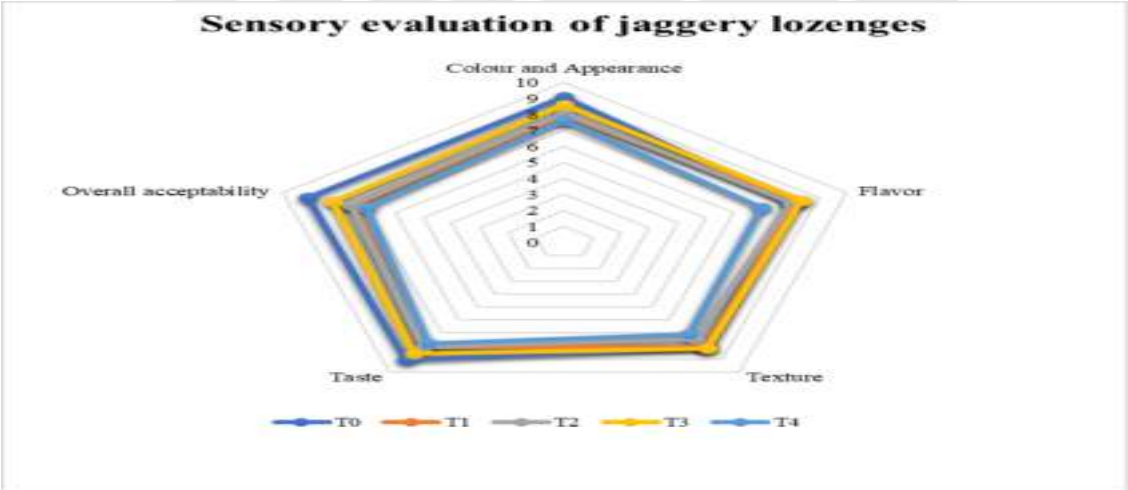


Fig. 2. Graphical representation of sensory evaluation

Table 3.Physical Characteristics of jaggery lozenges:

Parameters	Control (T_0)	T_3
Color	Brown	Dark brown
Shape	Square	Square
Length (cm)	3	3
Average Weight (g)	7.5	7.5
Hardness (kg/cm^2)	20	18

Data obtained from table3, Showed that the control sample was brown in colour and final sample was dark brown in colour due to addition of extracts.Both control sample and final sample was square in shape and length was 3 cm. Average weight of control sample and final sample was 7.5g and hardness of control sample was 20 kg/cm^2 and final product (T_3) was 18 kg/cm^2, due to addition of extracts in T_3 sample its hardness was decreases.

Table4. Hunter colour analysis of final product and control sample:

Colour value	Results	
	Control (T_0)	T3
L*	36.34 ± 0.41	34.81 ± 0.52
a*	10.08 ± 0.04	8.82 ± 0.39
b*	26.16 ± 0.39	24.80 ± 0.74
C	28.11 ± 0.45	26.47 ± 0.40
H	68.66 ± 0.41	70.37 ± 0.64

From the table 4 it was observed that L* value for control and T_3 sample was 36.34 ± 0.41 and 34.81± 0.52. a* value for control and T_3 was 10.08 ± 0.04 and 8.82 ± 0.39. b* value for control and T_3 sample was 26.16 ± 0.39 and 24.80 ± 0.74. C value for control and T_3 sample was 28.11 ± 0.45 and 26.47 ± 0.40. h value for control and T_3 sample was 68.66 ± 0.41 and 70.37 ± 0.64respectively**.**

Results and Discussion:

It could be revealed from table that maximum score for colour and appearance was recorded for sample T0 followed by sample T3(8.6) which was comparatively higher than the samples T1, T2 and T4. T4 score lower than all samples and alter the colour and appearance of jaggery lozenges, because higher concentration of extract imparts more brown colour to the sample which force the panel members to rank lowers. Scores of all the samples for colour and appearance parameter were above acceptable level The T3 sample had score higher for flavoured followed by T0 and T3. Sample T4 was significantly inferior to all because addition of higher proportion of extracts affects the flavour of the sample. The taste of sample significantly affected by the addition of extracts. The sample T3 containing 3% tulsi,3% Mint extract and 0.3 % adulsa extract was found to be statistically significant over sample T1, T2 and T4. The control sample had scored higher for texture because addition of extracts significantly affects the texture of sample. Considering all the above sensory parameter the sample control and T3 found to be significant over the all samples.

Sample T3 liked very much having more phytochemicals which will selected for further study. By comparing score given by panel members it was clear that colour and appearance, flavor, taste and overall acceptability of lozenges depends on the extract concentration.

Conclusion:

It can be concluded that the proposed research study for the development of jaggery lozenges proved to be rich in all nutrients, source of phytochemicals and liquid jaggery is best replacement of sugar.Treatment T_3 was selected on the basis of sensory evaluation. The selected T_3 sample has liquid jaggery with 3% Tulsi extract+ 3%mint extract+ 0.3% asulsa extract. Consequently, jaggery lozenges were developed with an improved formulation to help with sore throats while also boosting immunity and providing a pleasant mouthfeel and taste.

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