

Research Article

Formulation and Evaluation of Lemongrass Hand Sanitizer

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ARTICLE INFO

Article history:
Received: 17/04/2023;
Revised: 21/04/2023 ;
Accepted: 28/04/2023.

Key Words:
Lemongrass,
Cymbopogon citratus,
hand sanitizer

Please cite this article
as: Patil R. et al.
**Formulation and
Evaluation of
Lemongrass Hand
Sanitizer** 5(1),19-21.

ABSTRACT

Lemongrass is very common plant in garden of Indian people, offently used with tea as a flavor. Lemongrass (Biological name- *Cymbopogon citratus*) is used for treating digestive tract spasms, stomachache, high blood pressure, convulsions, pain, vomiting, cough, achy joints (rheumatism), fever, the common cold, and exhaustion. It is also used to kill germs and as a mild astringent. Lemongrass (leaf, stem) was collected from institute Garden. The Phytochemical parameters for the lemongrass were studied with the aim of drawing the phytochemical standards for this species. The 5% water extract of lemongrass used for preparation of hand sanitizer. As per the WHO guideline iso-propyl alcohol based hand sanitizer prepared and 5% lemongrass extract in water used instead of distilled water. The study includes phytochemical standardization of lemon grass as per Indian Pharmacopoeia and antimicrobial study. The Phytochemical Investigation revealed the presence of primary and secondary metabolites as amino acids, flavonoid, tannins, terpenoids, keto steroids, phenols and carbohydrates. The total Ash Value was found to be for lemongrass is 08.63% w/w. Antimicrobial study proves that as compare to 5% water extract of lemon grass hand sanitizer the 5% water extract hand sanitizer of lemongrass shows enhanced anti-bacterial activity on *Staphylococcus aureus*, *Bacillus subtallis*, *Escherichia Coli*, *Proteus vulgaris* and *Pseudomonas aeruginosa*. The presence study includes preparation and evaluation of 5% Water extract Lemon grass hand sanitizer first time.

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INTRODUCTION

Lemongrass is very common plant in garden of Indian people, offently used with tea as a flavor (Naik, M.I., et al., 2010). Lemongrass (Biological name- *Cymbopogon citratus*) is used for treating digestive tract spasms, stomachache, high blood pressure, convulsions, pain, vomiting, cough, achy joints (rheumatism), fever, the common cold, and exhaustion. It is also used to kill germs and as a mild astringent (N.P. Mangalagiri et al., 2021).

Materials and Methods

Collection of Plant Material

Lemongrass (leaf, stem) was collected from institute Garden. Botanical identification of plant was authenticated by Assoc. Prof. Rajesh T. Wankhade, Dept. of Dravyguna, SMBT Ayurvedic College and Hospital, Nashik.

Preliminary Phytochemical Study

The successive extractive values carry out as per the procedure of C. K. Kokate (2002). Physical Evaluation-

Moisture content of the powdered determined based on the loss of drying method Khandelwal (2007). The ash values were determined, to find out about the physiological state and level of extraneous matter. Extractive values were determined according to the official methods prescribed in Ayurvedic Pharmacopoeia. TLC Finger Print Profile-Thin layer chromatography of the ethanolic extract was studied and Rf values were determined (Harborne JB.)⁷.

Preparation of Handwash

The Lemongrass Iso-propyl alcohol based hand wash prepared as per general procedure mentioned for WHO Guidelines⁸. The fresh 25g leaves and stem plant of lemon grass cut into pieces (Fig.1). The cut leaves macerated with 500ml distilled water, then filter it. As per WHO guideline Iso-propyl alcohol based hand wash prepared and instead of distilled water above lemongrass 5% extract used (Table 1).



Fig.1: Lemongrass Leaves

Ingredient	Qty (ml)
Iso-propyl alcohol (98%)	75.15
Hydrogen peroxide (3%)	4.17
Glycerol (98%)	1.45
5% lemongrass water extract	q.s to 100ml



Fig.2: Trial batches of Lemongrass Handsanitizer

Antimicrobial study

Antibacterial study conducted for prepared hand sanitizer against Gram +ve and -ve bacterial. Cup-plate

diffusion method used to find out antibacterial study (Mandal & Mondal; 2007).

Results and Discussion

The moisture content seems to be lower than necessary to support the growth of microbes to bring any change in the composition of the drugs. Physical constant as ash value of the drug gives an idea of the earthy matter or the inorganic composition and other impurities present along with the drug. Extractive values are useful for the determination of exhausted or adulterated drugs (Table 1). The Phytochemical Investigation revealed the presence of primary and secondary metabolites as amino acids, flavonoids, tannins, terpenoids, keto steroids, phenols and carbohydrates. Thin layer chromatography of the ethanolic extracts was carried out using Ethanol: Ethyl acetate (6:4) as mobile phase, silica gel GF254 as stationary phase and the Rf were recorded as 0.17, 0.21, 0.27, 0.79 and 0.97. The total Ash Value was found to be for lemongrass is 08.63 w/w (Table 2).

Table 2: Physical Evaluation of Lemongrass leaves

Parameter	% w/w
Ash Values	
Total	08.63±0.315
Acid - insoluble	01.46±0.130
Water – soluble	05.24±0.105
Extractive Values	
Pet. Ether Soluble (40-60o)	03.13±0.176
Ethanol Soluble (95%)	10.07±0.561
Water Soluble	11.29±1.106
Moisture content	07.67±0.346

In Antimicrobial of Lemongrass leaves hand sanitizer showed activity against *S. aureus*: 33mm, *B. subtilis*; 27mm, *E. coli*; 28mm, *P. vulgaris*; 23mm and *P. aeruginosa*; 20mm. Gentamycin taken as a standard during the activity and we can say that the lemongrass hand sanitizer shows significant activity when compare with standard. The results were tabulated in Table 3 for antibacterial activity.

Table 3: Antimicrobial study of Lemongrass leaves

Microorganism	Inhibition Zone (mm)	
	Lemon grass Hand Sanitizer	Standard (Gentamicin)
<i>Staphylococcus aureus</i>	33	35
<i>Bacillus subtilis</i>	27	29
<i>Escherichia Coli</i>	28	32
<i>Proteus vulgaris</i>	23	25
<i>Pseudomonas aeruginosa</i>	20	23

++ presence; -- absent

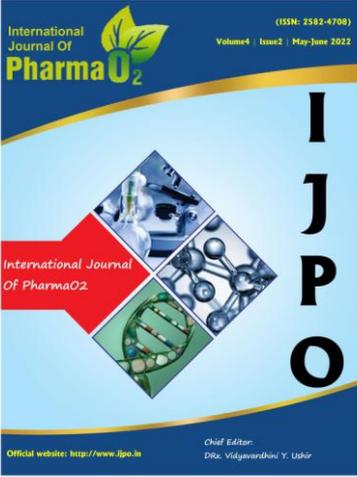
This initial study demonstrated that Lemongrass leaves effective against pathogenic microbes. It is an attempt made to prove leaves have anti activity. From the result we can conclude that the Lemongrass use for the preparation of Hand sanitizer and it shows promising antimicrobial effect.

Acknowledgement

The author(s) are thankful to management of SMBT Sevabhavi Trust, Dhamangaon (Nashik; India) for providing facilities

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