

Formulation and Development of Liquid Herbal Syrup by using Guava, Indian Mulberry, Pomegranate and Apple Fruit Extract

Shibanjan Paul Roy, Kamal Deka, Shyam Prakash Rai

Abstract:- Our research about formulation and proper development of a liquid herbal based syrup by using a proper combination of guava fruit, Indian mulberry fruit, pomegranate fruit and apple fruit extracts is described in our research study. Our research objective was to create a natural herbal syrup that properly harnesses the potential health benefits by these fruits extracts. Our research involved by selecting the fruits extracts based on their individual medicinal properties and synergistic effects. Our research methods included fruit extraction, formulation and Development with sensory evaluation. Our results indicated a very successful development of liquid herbal based syrup, by providing a good and potential natural remedy with various health benefits. This research is guided and written skills done by Guide cum Research-Teacher-in-Charge Mr. Shibanjan Paul Roy, Mr. Kamal Deka and Mr. Shyam Prakash Rai performed for the practical and others work and note the reading under his guidance and observation.

I. INTRODUCTION

The herbal preparations have been properly utilized for centuries to address properly for various health conditions and promote well being. The fruits like Guava, Indian mulberry, pomegranate and apple fruits are renowned for their nutritional and medicinal values. Guava is very rich in vitamin C and has antioxidant activity otherside Indian mulberry is a good source of vitamins and minerals, pomegranate fruit contains polyphenols compounds and has antiinflammatory activity, while apples are well packed with dietary fiber and various essential nutrients. In this research by combining these fruits into a liquid herbal syrup offered a synergistic effect by enhancing their health benefits.

Our research study was to develop a liquid herbal syrup that incorporates the goodness of these type fruits extracts to offer a natural and effective remedy. Our formulation properly process was properly designed to preserve the active compounds present in the fruits while we ensuring an appealing taste for easy consumption, especially for those matter who prefer natural alternatives to conventional medications.

II. MATERIALS WITH PROPER METHODS

In our research our herbal based syrup was prepared. we first collected the fruits extracts from local market near our lab. After the fruits were properly peeled for obtain about the edible portion.250.001gm of this edible portions were chopped in a blender. After we used the whatsman filter paper for the fresh extracts. After our fresh extracts used and making the F1 and F2.

III. ANALYSIS AND INSPECTION OF ANTIBACTERIAL ACTIVITY

In this research we used agar well diffusion method to determine properly of antibacterial activity of F1 and F2 aganist pathogens of *S. aureus* and *S. mutans*. As in microbial suspension the secondary cultures were dispersed as evenly on surface of the rose bengal and mullen hinton agar plates by using spreader with sterile medium. Different concentrations of F1 and F2 of 25 μ l,50 μ l and 100 μ l as incorporated through micropipette into wells as created on agar plate by using sterile cork borer. After we incubated the plates 37 $^{\circ}$ C for 26hr to 46hr.Commercial antibiotic Amoxycillin 50mg/ml we used as positive control for *S.aureus* and *S.mutans*. As we recorded the zone of inhibition for each of the plate and compared as the control group. all of our tests were properly replicated as triplicate for inspection and analysis.

As 35ml of syrup of F1 we did as 24.6ml of invert sugar base +sweet lemon oil 3.5ml+ mixed guava fruit extract 2.4ml,pomegranate fruit 2.4ml,indian mulberry 1.925ml and apple fruit 0.175ml of F1 and F2

Table 1 Formulation F1 of 35ml of syrup

Ingredients	Quantity
Guava fruit extract	2.4ml
Pomegranate fruit extract	2.4ml
Indian mulberry fruit extract	1.925ml
Apple fruit extract	0.175ml
Sweet lemon oil	3.5ml
Invert sugar base	24.6ml

Table 2 Formulation F2 of 35ml of syrup

Ingredients	Quantity
Guava fruit extract	4.8ml
Pomegranate fruit extract	4.4ml
Indian mulberry fruit extract	2.125ml
Apple fruit extract	0.175ml
Sweet lemon oil	3.5ml
Invert sugar base	20ml

Table 3 F1 formulation Antimicrobial activity by ZOI

Organisms	Zone of Inhibition in mm			Amoxycillin
	25µL	50µL	100µL	
Staphylococcus Aureus	4.76 ±1.21	5.89 ±1.23	7.81 ±1.89	19.81 ±0.11
Streptococcus Mutans	3.13 ±1.19	4.87 ±1.79	6.57 ±1.71	18.73 ±0.57

Figure1

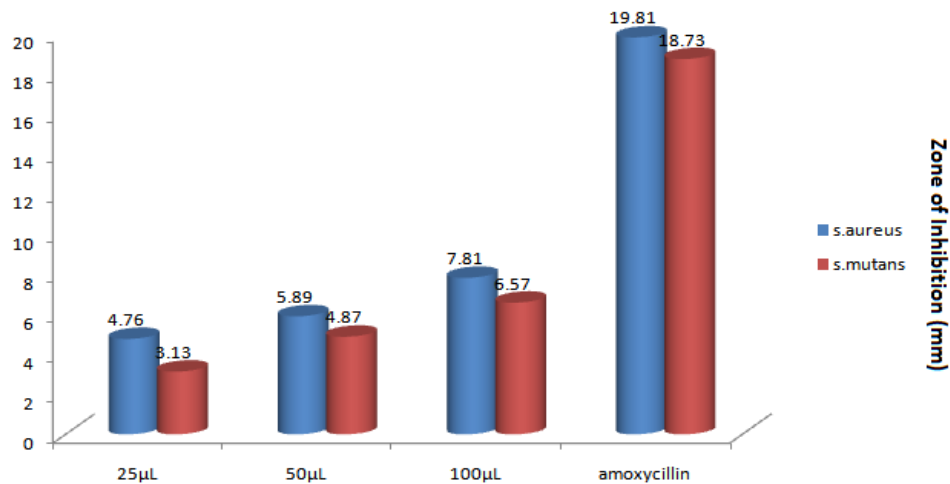


Fig 1 F1 formulation Antimicrobial activity by ZOI

Figure-2

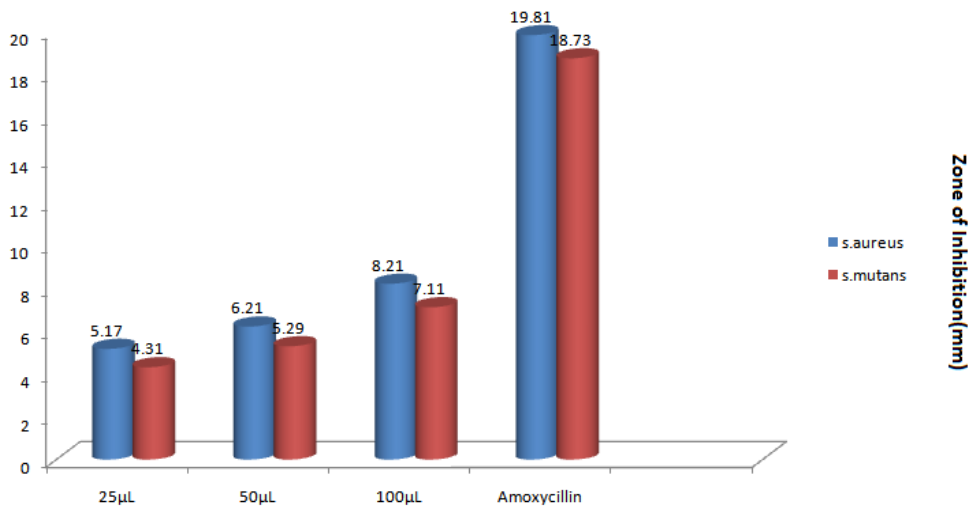


Fig 2 F2 formulation Antimicrobial activity by ZOI

Table 3 F2 formulation Antimicrobial activity by ZOI

Organisms	Zone of Inhibition			Amoxicillin
	25µL	50µL	100µL	
Staphylococcus Aureus	5.17 ±1.03	6.21 ±1.17	8.21 ±1.93	19.81 ±0.11
Streptococcus Mutans	4.31 ±1.11	5.29 ±1.71	7.11 ±1.21	18.73 ±0.57

IV. RESULTS

➤ *Colour-Reddish*

➤ *Taste-Sweet*

➤ *pH*

As in this research we used pH meter and by following the methods of (SHIBANJAN PAUL ROY ET AL) pH will be 6.7 and 6.9.

➤ *The proper determination of Antimicrobial Activity*

Our formulated syrup F1 and F2 antimicrobial activity with zone of inhibition shown in the figures properly.

For our research this liquid herbal syrup containing Guava fruit extract, Indian mulberry fruit extract, pomegranate fruit extract, and apple fruit extract was successfully formulated. Our formulated syrup had an appearance colour, taste, and odour, which was well received during the our sensory evaluation.

In this we did the antimicrobial activity of this research but further research needed.

V. DISCUSSION

Our combination of Guava fruit extract, Indian mulberry fruit extract, pomegranate fruit extract and apple fruit extract in the liquid herbal syrup offers a broad spectrum of very good health benefits. The Guava's high vitamin C content supports the proper immune system, Indian mulberry's nutrients promote overall proper vitality, pomegranate's antiinflammatory properties aid in combating oxidative stress and apple's dietary fiber contributes to proper and good digestive health.

As we blending these fruits extracts, their individual properties synergistically enhance overall efficacy and potency of the herbal syrup. Moreover, our formulated liquid form ensures easy proper ingestion and proper assimilation by the body.

Our liquid herbal syrup has potential to be a good valuable and addition to natural remedies, by providing a very convenient and delicious way to harness the health benefits of these fruits. Further research studies on its efficacy and proper potential therapeutic applications are properly warranted to establish its good position as a natural alternative in promoting health and wellbeing.

ACKNOWLEDGEMENT

This research is guided and written skills done by Guide cum Research-Teacher-in-Charge Mr. Shibhanjan Paul Roy a Freelancer Scientist Qualification-M. Pharm(Pharmacology) Address-Race Course Para, Jalpaiguri has 9 individual research publications with 3 individual patents with he guided in 8 researches has 5 awards as Asian Best Scientist Award 2023 by World Research Council. In this research Shibhanjan Paul Roy guides Mr. Kamal Deka M. Pharm(Pharmaceutics)-Former Principal of Crescent Institute of Pharmacy now Assistant Professor of Royal School of Pharmacy under Assam Royal Global University and Ph.D pursuing from 2021 has more than 8 research publications with 1 patent and 3 book chapters and Mr. Shyam Prakash Rai a Young Scientist has 6 research publications with 1 individual research publication. Mr. Kamal Deka and Mr. Shyam Prakash Rai performed for the practical and others work and note the reading under Guide-Mr. Shibhanjan Paul Roy's guidance and observation.

REFERENCES

- [1]. Nerkar, Amit & Gade, Pallavi. (2023). Formulation and evaluation of herbal syrup of Indian mulberry (Noni). *Current Trends in Pharmacy and Pharmaceutical Chemistry*. 5. 42-44. 10.18231/j.ctppc.
- [2]. Raju, Korem & Rose, A. & Rohini, B. & Sahaja, P. & Shylaja, G. & Simran, Saifa. (2020). Formulation and evaluation of anti diabetic herbal syrup. *Research Journal of Pharmacognosy and Phytochemistry*. 12. 141. 10.5958/0975-4385.2020.00023.0.
- [3]. Nerkar, Amit & Nagarkar, Rushikesh. (2023). Formulation and evaluation of medicated herbal syrup of vinca extract. *Current Trends in Pharmacy and Pharmaceutical Chemistry*. 5. 63-66. 10.18231/j.ctppc.2023.014.
- [4]. Paul Roy, Shibhanjan & Deka, Kamal & Prakash Rai, Shyam & Mishra, Pratyush. (2023). FORMULATION OF A NOVEL HERBAL BASED SHAMPOO FOR HAIR.
- [5]. Farhana, Jasmin. (2017). Antibacterial Effects of Guava (Psidium guajava L.) Extracts Against Food Borne Pathogens. *International Journal of Nutrition and Food Sciences*. 6. 1. 10.11648/j.ijnfs.20170601.11.

- [6]. Deb Barma, Manali & Kannan, Srisakthi & Indiran, Meignana & Shanmugam, Rajeshkumar & Kumar.R, Pradeep. (2020). Antibacterial Activity of Mouthwash Incorporated with Silica Nanoparticles against *S. aureus*, *S. mutans*, *E. faecalis*: An in-vitro Study. *Journal of Pharmaceutical Research International*. 25-33. 10.9734/jpri/2020/v32i1630646.