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Formulation and Evaluation of Herbal Hand Wash from Psidium Guajava Leaves

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ABSTRACT

Herbal medicines are important part of healthcare throughout the humanity. Herbal medicines have been extensively utilized as effectual remedies for the prevention and management of multiple health conditions and they are easily available cheap and harmless compared to chemical product. So considering this benefit of herbal plants they are tried to use in hand wash formulations. Hand-washing is tremendously essential in healthcare and household segment Numerous of the antiseptic hand wash available in the market which have some adverse effects. To evade these difficult things like burning, drying, frustration, dermatitis etc., of the synthetic hand wash formulations an attempt has been made to formulate a poly herbal hand wash using extracts of Psidium Guajava L. leaf extracts. The anti-microbial action of the equipped herbal hand wash was tested against the skin pathogens, and its competence was confirmed using cup plate method. The results from Cup Plate Method showed that the hand wash prepared from alcoholic and aqueous extract of Psidium Guajava L. leaf extract have effective activity due to the combined activity of photo constituents present in the extracts. The results from the current work hold the integration and operation of herbs in the formulations to give a in good health effect. hand wash evaluate by expert parameters like purpose parameter like color , smell and chemical parameters like pH., thickness Foam height, Foam maintenance, Anti-Microbial movement Skin impatience test etc. And obtained results were in the adequate limits with less or no side effects.

KEYWORDS: - Herbal hand wash, *Psidium Guajava L* leaf, anti-bacterial activity, cup platemethod

INTRODUCTION

Cosmetics are intended to be applied externally. They include, but are not limited to products that can be applied to the skin care treatments to the hand like hand wash is the important formulation .hand washing is as well famous as hand cleanliness is the perform of clean-up hands for the intention of remove soil, dirt and microorganisms .The main medical purpose of washing hands is to cleanse the hands of pathogens (bacteria or viruses) and chemical can cause harm or disease. These are specially important for people who handle food or work in the medical field, but also important practice for the general public.Hand washing with hand wash consistently at critical moments during the day prevents the spread of diseases like diarrhea ,cholera which are transmitted through fecal oral routes.

The community can grow to be infected with respiratory disease such as influenza or the common cold ,for case ,if they do not wash their hands before touching their eyes ,nose or mouth.so to avoid this or prevent a definite poly herbal hand wash is one of the effective formulations .As it does not contain synthetic ingredients so there is no side effects.

HAND WASH: It is product used to remove the harmful pathogens, dirt, and other pollutants from the skin of hand to keep the hands free from microorganism

These formulation contains following ingredients such as extract of guava leaves, along with other excipients such as gelling agent, foaming agent, preservative, neutralizer, vehicle and perfume .cosmetics are developed to reduce Plants are the oldest resource of pharmacologically active compounds and have provided human kind with many medicinally valuable compounds from centuries. Hands are main approach of spread of germs and infection

Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent the nosocomial infections.

To protect the skin from injurious bacteria and to stay away from distribution of numerous infectious diseases, hand washing is tremendously important provision.

Hand washing is the proceed of clean-up the hands by for the reason of remove soil, dirt, pathogenic bacteria and avoid transmit of transient germs. newly there has be a lot of awareness alert on produce medicines and yield that are natural. Several fruits and fruit extracts, to exhibit antimicrobial activity against E. Coli. This suggest that vegetation which obvious comparatively high levels of antimicrobial act may be sources of compound that can be used to reduce the expansion of food bear pathogens. Bacterial cells could be killed by the rupture of cell walls and membranes. The guava (*Psidium Guajava L*) is a phyto therapic plant used in folk medicine that is believed to have active components. That helps to treat and manage various diseases. The

numerous parts of the fasten have been used in conventional medicine. To manage conditions like malaria, gastroenteritis, vomiting, diarrhea, dysentery wounds, ulcers, toothache, coughs, sore throat, inflamed gums, and a number of other conditions. This plant has also been used for the controlling of life-changing conditions such as diabetes, hypertension, and obesity. In this learn, we aspire to estimate the sum extract of *P. Guajava* leaves, by means of a variety of aqueous and natural solvents to set up if it is effective against killing or inhibit the development of foodborne bacterium Staphylo-coccus aureus, Escherichia coli, Salmonella enteritidis, along with Bacillus cereus which can reason foodborne illness with spoilage.

ADVANTAGES OF HERBAL HAND WASH:

1. Cleaning the hand by removing dirt, pollutant, and harmful microorganisms.
2. Lowers the risk of diarrhea and intestinal problems.
3. Avoidance of common eye infections.
4. Obstruction of respiratory tract infections.
5. These prevents the spread of diseases and keeps your environmental, safe, fresh and clean.

GUAVA LEAVES EXTRACT:- Guava leaves shows higher antibacterial, antioxidant, anti-inflammatory, antiseptic properties. Much of guava therapeutic activity to flavonoids had demonstrated antibacterial activity. This are used to kill the bacterial growth of microorganisms.

REVIEW OF LITERATURE

1. **Anshikamalaviya et al. (2011) –** An international joural – In these paper they evaluated the antimicrobial activity of aqueous and alcohol extracts which was prepared from fresh fruits of *Psidium Guajava* and citrus sinenses the anti-microbial activity were tested against bacteria and fungi by the use of agar well diffusion method. The aqueous extract shows higher antimicrobial activity as compared to alcoholic extracts.
2. **Maria rosary devi kartika rini et al. (2015) –** International journal of current- in these paper they study the use of water and ethanol as solvents to obtain optimum active compounds of the extracts. . The result show to facilitate the advanced the pleased of phenol total was establish in the dig out, the higher the inspiration index value was obtain for both solvents. though, the encouragement index worth was not only partial by antioxidant action. The motive was that the type of vigorous mix in Guava leaf extract liable for immune stimulatory activity was possibly not only poly phenolic antioxidant.
3. **Antonio H. Chua et al. (2013)-** Phillipine journal of otolaryngology- In these research paper they formulate and evaluated Psidium Guajava leaves mouthwash which is effective against management of patients with aphthous ulcers.guava leaves mouth washes was effective for apthous ulcers in terms of reduction of symtoms of pain and faster reduction of ulcersize. Patients who administered guava leaves mouthwashes generally fared better than those administered isotonic sodium chloride solution.
4. **Santhanamari thiyagarajan et al. (2015)-** International monthly of research in-in these paper they estimate the lethal activity of Psidium Guajava extracts on bacterial pathogens cause diarrheal infection. The aim of these study to investigate the antibacterial property of extracts of guava leaves against diarrhea causing bacterial pathogens. The methanol extract of Psidium Guajava L. As verified in these learn could be consider as a appropriate and safe choice to these drugs.
5. **Woong Mo Yang et al. (2012) -** International journal of investigate-in these paper they evaluate the anticancer effects of guava leaf extracts and its fractions. The chemical composition of the active extracts were also firm. In the present study, we set out to decide whether the anticancer belongings of guava leaves are connected with their aptitude. This outcome of GHF connected with down-parameter of a variety of proteins that mediate cell proliferation, cell endurance, metastasis, and angiogenesis. Analysis of GHF by gas chromatography and gas chromatography-mass spectrometry tentatively identified Overall, these findings suggest that guava leaves can interfere with multiple signaling cascades linked with tumorigenesis and provide a source of probable healing compound for both the avoidance and action of cancer.

NEED OF PRESENT INVESTIGATION

Now days many formulations are available in the market which comes under the classes cosmetics .there are many preparations which are made according to need of skin e.g.Dry skin ,sensitive skin. But having many disadvantages that contain synthetic chemicals which having number of side effects. Generally every individual have different physiology in case of response to any formulations.so effect of formulation may differ from person to person. Some peoples shows good response while some shows allergic condition as side effect of some formulation.in such cases it is difficult to manufacture one uniform preparation that will shows similar effect for Large population .This difficulty is mainly due to the reaction and sensitivity of individual to chemical present in formulation. Avoiding the use of synthetic chemicals may become selective criteria and smart ways to manufacture for such purpose use of herbal ingredients along with the herbal drug may be a smart choice. Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent the nosocomial infections. To protect the skin from damaging micro-organisms and to keep away from dispersion of many contagious diseases, hand washing is extremely major safety measure. Hand washing is the proceed of cleaning the hands with for the function of remove soil, dirt, pathogenic bacteria and avoid transmit of passing micro-organisms**.**

OBJECTIVES

1. To extract the active phytoconstituents from guava leaf
2. To formulate herbal hand wash by using guava leaf extract
3. To evaluate developed herbal hand wash

DRUG EXCIPIENTS PROFILE

1) GUAVA LEAVES:- ***Psidium Guajava L.***

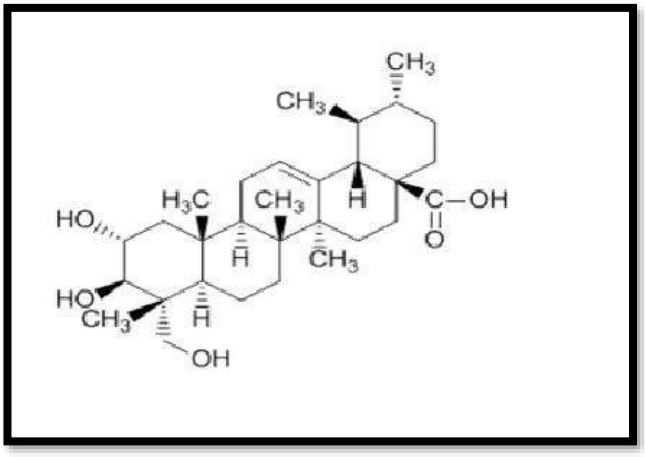


Fig.No.1. Structure of *Psidium Guajava L*

CHEMICAL NAME: - Flavonol morin, morin-3-0-lyxoside, morin-3-0-arabinoside, quercetin and quercetin -3-0-arabinoside.

SOLUBILITY: - soluble in ethanol, methanol.

Drug profile

Fig.No.2 Guava leaves

Scientific classification of Guava

Kingdom:	Plantae
Clade:	Angiosperms
Clade:	Eudicots
Clade:	Rosids
Order:	Myrtales
Family:	Myrtaceae
Species:	P. Guajava

Genus: Psidium

Binomial name: Psidiumguajava

Synonym: True guava, Guava bush, Psidiumguajava

Description:

Guava fruits, typically 4 to 12 centimetres (1.6 to 4.7 in) extended, are round or oval depending on the class. They contain a marked and typical smell, related to lemon rind but less pointed. The surface skin may be uneven, frequently with a sour taste, or soft and sugary. unreliable among kind, the skin can be any depth, is frequently green before ripeness, but may be yellow, maroon, or green while ripe. The flesh within may be sweet or sour and off-white ("white" guavas) to deep pink ("red" guavas). The seeds in the central pulp vary in figure and hardness, depending on species.

Chemical constituents

Nutrients

Guavas are affluent in food thread and vitamin C, with reasonable levels of folic acid. Having a usually wide, low-calorie shape of necessary nutrients, a single ordinary guava *(Psidium Guajava L.*) fruit contains about four times the amount of vitamin C as an carroty. though, nutrient content vary across guava cultivars. though the strawberry guava (P. Littorale var. Cattleianum) have just 25% of the measure create in added general variety, its total vitamin C pleased in one serving (90 mg) still provides 100% of the nutritional spot eating.

Phytochemicals

Guava leaves include both carotenoids and polyphenols similar to (+) gallocatechin and leucocyanidin.As a number of of these phytochemicals create the fruit skin and fleshy tissue color, guavas to facilitate are red-orange be apt to have additional polyphenol and carotenoid satisfied than yellow-green ones.

2) CARBAPOL 940:-

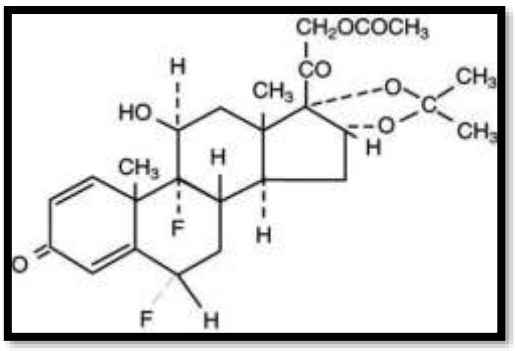


Fig.No.3 Structure of Carbapol 940

CHEMICAL NAME:-Poly (acrylic acid)

MOLECULAR WEIGHT:-Approx. 500,000 to 4,000,000 g

MOLECULAR FORMULA:- $(C_3H_4O_2)n$

SOLUBILITY:-they are linear polymer and is soluble in water.

3) SODIUM LAURYL SULPHATE:-

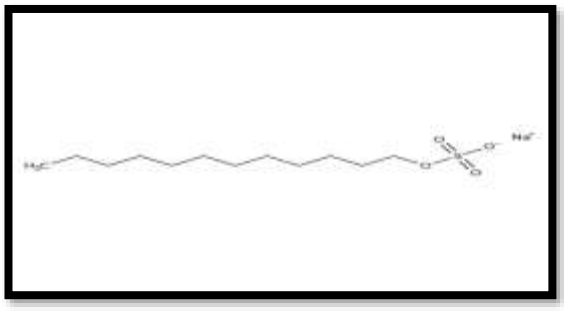


Fig.No.4 Structure of Sodium Lauryl Sulphate

CHEMICAL NAME:- sodium lauryl sulphate/sodium dodecyl sulphate

MOLECULAR FORMULA: - nac12h25so4

MOLECULAR WEIGHT:- 288.372 g/mol

SOLUBILITY:- soluble in water and ethanol

4) METHYL PARABEN:-

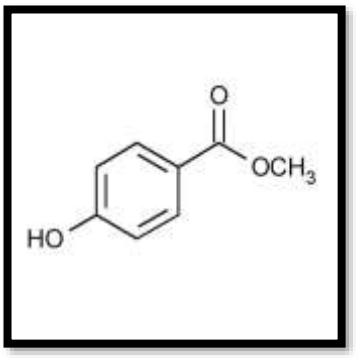


Fig.No.5. Structure of Methyl Paraben

CHEMICAL NAME:- Methyl 4-hydroxy benzoate

MOLECULAR FORMULA:- C8H8O3

MOLECULAR WEIGHT:- 152.149 g/mol.

SOLUBILITY:- soluble in ethanol and water.

5) TRIETHANOLAMINE:-

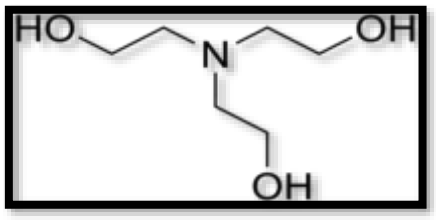


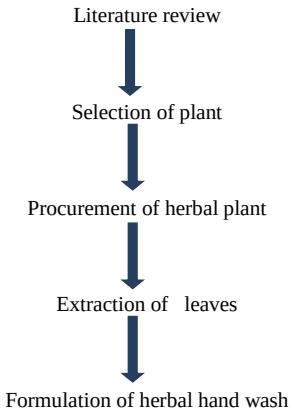
Fig.No.6. Structure of Triethanolamine

CHEMICAL NAME:- Tris(2-hydroxyethyl)amine

MOLECULAR FORMULA:- C6H15NO3

MOLECULAR WEIGHT:-149.19 G/MOL-1

PLAN OF WORK



Evaluation studies

Data completion and project writing

EXPRIEMENTAL WORK

MATERIALS AND METHOD

Table No.1 The following chemicals and herbal ingredients were used for the preparation of herbal hand wash.

Chemicals	Source
Carbapol 940	Laboratory reagent
Triethanolamine	Laboratory reagent
Sodium lauryl sulphate	Laboratory reagent
Methyl paraben	Laboratory reagent
Guava leaves extract	Laboratory reagent
Distilled water	Laboratory reagent

Collection: leaves of Psidium Guajava were collected from botanical garden.

Extraction of guava leaves

Soxhlet apparatus extraction process in different components which used in Soxhlet extraction like thimble, water cooling system, and reservoir, by pass tube, siphon tube and condenser. We will take 50 mg of solid material of leaves keep in thimble which is loaded into Soxhlet vessel having flask containing extractor solvent. Solvent steam move up to the column and floods into the chamber housing the thimble of solid. a few part of non- unstable compound dissolve in in the chips. Process repeats many times until we get desired concentrated compounds in flask Process has been done at boiling temperature of solvent and extraction has been done in 500 ml ethanol for 3.5 hours.

Fig.No.7 Soxhlet apparatus

FORMULATION TABLE

Table No.2 Preparation of herbal gel base for herbal hand wash

Sr.no	Name of ingredient	Quantity taken for 100 ml			Use of ingredient
		F1	F2	F3	
1	Carbapol 940	0.2gm	0.4gm	0.6gm	Jelling agent
2	Purified water	40 ml	40ml	40ml	Vehicle
3	Triethanolamine	Q.s.	Q.s.	Q.s.	Neutralizer

Table No. 3 Preparation of herbal gel based hand wash.

Sr.no	Name of ingredient	Quantity taken			Use of ingredient
		F1	F2	F3	
1	Gel base	60 ml	60ml	60ml	Base
2	Sodium lauryl sulphate	2 gm	2.5gm	3gm	Foaming agent
3	*PsidiumGuajava* extract	1.5 gm	1.5gm	1.5gm	Antibacterial agent
4	Methyl paraben	0.38gm	0.38gm	0.38gm	Preservative
5	Rose water	Q.s	Q.s.	Q.s.	Fragrance agent

Formulation of herbal hand wash-

- Herbal gel was equipped using carbopol-934 as a gelling agent in 1% w/w concentration with deionized water suddenly. Then the swell polymer was stirred via a automatic stirrer to make sure the even dispersion of the polymer. The pH was adjusted to 7.0 by the addition of minute quantities of triethanolamine with nonstop stirring. next this base be use to slot in mine of Psidium Guajava extract to prepare a formulation of hand wash gel as per Table 1 and 2. The formulation was undergone organo leptical evaluation.

EVALUATION OF FORMULATION

1. Organoleptic evaluations:-

i. Colour : Pale yellow

ii. Odour : Characteristic

iii. Consistency : Smooth

2. Physical evaluation:-

i. Ph : The ph was determined by using pH paper.

ii. Viscosity: The viscosity of herbal gel based handwash was determined by using digital brooke field viscometer.

Fig.No.8 Brookefield viscometer

iii. Foam height:- 1 gm of sample of herbal gel based handwash was taken and dispersed in 50 ml distilled water then transferred into 500 ml stoppered measuring cylinder volume was makeup upto 100 ml with water.25 strokes was given and stand till aqueous volume measured upto 100 ml & measured the foam height above the aqueous volume.

iv. Foam retention:- 50 ml of the herbal gel based hand wash was taken into 250 ml graduated cylinder and shaken 10 times. The volume of foam at 1 minute intervals for 4 minute was recorded.

v. Skin irritation test:- Soft feeling with no skin irritation after 30 minute.

vi. Appearance and homogenecity:-The herbal gelbased handwash were homogenous yellow in colour and translucent in nature.

Antimicrobial studies of herbal hand wash gel

The transmission of antimicrobial efficiency of the formulate herbal gel base handwash was aseptically perform on amateur associate cultures by using cup plate technique. For theses standard cup plate method the nutrient agar medium is used as a culture media . To performed antimicrobial test the pre sterilize petri plate was used .to presterilize, the petri plate was incubate for 24hrs at 370c.then next to these the agar culter media is pour on the petri plate uniformly in aseptic condition.After spreading the agar medium is covered with another petri plate and kept aside for 24hrs in refrigerator to solidify the agar medim. After these the plate was removed and on these plate the cup was formed. On two particular plate the standard solution which contains microorganism strains i.e. *E.coli* and *Basillussubstalis* were uniformly spread in aseptic condition .Now in the cup which are created on two petri plate the standard which is pure antibiotic Gentamycin 1ml is poured by the pipette and in next cup the formulated herbal hand wash is poured in aseptic condition. Then these two plate kept for incubation for 24hrs at 370C.After the incubation period the inhibition was found on petri plate

Composition agar medium

Table No.4. Table for composition of agar medium

Sr.no	Ingredient	Quantity(gm)
1	Peptic digest of animal tissue	5.00
2	Sodium chloride	5.00
3	Beef extract	1.50
4	Yeast extract	1.50
5	Agar	8.5

The petri plate shows zone of inhibition .on petri plate the zone of inhibition of herbal hand wash and pure form of antibiotic Gentamycin is appeared in image A the zone of inhibition of *E,coli* is appeared and in image B the zone of inhibition of *Bacillus substallis* is appears .

Result of antimicrobial test

Result of antimicrobial test of herbal hand wash against standard of pure antibiotic Gentamycin is measured in mm by scale .In these particular evolution test the anti microbial activity of herbal hand wash is found and on the basis of these information we can say that the herbal hand wash shows some what lesser activity than pure antibiotic Gentamycine .But defiantly the formulated herbal hand wash has antimicrobial activity against bacterial specis like *E.coli* and *Bacillus substali*.

Fig No. 9 *Baciilussbustallis*

Fig No. 10 *E.coli*

RESULTS AND DISCUSSION

By using herbal extract of guava leaves the hand wash gel is prepared and evaluated with marketed preparation successfully. The herbal hand wash was evaluated for its organoleptic properties ,physical properties and microbiological test.

Fig. No.11. Formulation of gel

Formulation F1(a)

Formulation F2(b)

Formulation F3(c)

Results obtained from formulation

Table.No.5 Results obtained from formulations.

Formulation Batches	Colour	Odour	Consistency	Ph	Spreadability	Washability	Foamability
F 1	Pale Green	Rosy	Smooth	7.7	4	Good	Good
F 2	Pale Green	Rosy	Smooth	7.3	3.5	Good	Good
F 3	Pale Yellow	Rosy	Smooth	7.2	2	Good	Good
Marketed	Green	Charac-Teristic	Smooth	7	3	Good	Good
5	Microbial test			Standard		Test	
	A)*Escherichia coli*			45		36	
	B)*bacillus subtalis*			42		27	

As we go through all the parameters we get following results and they are:

Colour –

Colour of all three formulations are same i.e. Pale green colour while the marketed formulation having green colour.it was evaluated by visual observation.

Odour –

Due to presence of rose oil all three formulations having rosy smell while the marketed formulation shows characteristic smell. We are added rose oil as a perfume because there is their odour at the time of storage so rose oil gives proper perfume which will increase the acceptance of face wash.

Consistency –

All three formulations shows smooth consistency and also the marketed formulation shows smooth consistency.

PH –

The ph of formulation f1, f2, f3, was found to be 7.7, 7.3 and 7.3 respectively.which are physiologically acceptance for skin preparations to avoid the risk of irritation upon application to the skin.

Washability –

When formulation were applied to the skin it was evenly applied and it shows good washability, when washed in running tap water that the adherence of formulation is good it doesn't take so much time for removing from the skin. Formulation f2 has a good washability as compared to formulation f1 and f3 .formulation f3 is more viscous one.

Spreadability –

Easy spreadability is one of the important characteristic of any handwash preparation as far as consumer acceptance. Higher spreadability allows ease of application thereby increased surface area available for active ingredient permeation. The spreadability of formulation f1,f2 and f3 was found to be for, 3.5 and 2 spreadable by small amount of share.

Foamability –

It was determined by taking 1 gm of sample in 10 ml of water initial volume is measured and when it shaken with water it shows final volume more than that of initial one. All these formulations shows good foam ability , but batch f2 shows most satisfactory results then it compared with marketed formulation.

Marketed formulation which is used named as patanjali neem hand wash. All evaluation parameters are also peformed for these preparations and comparisons of marketed and prepared formulation was done.

CONCLUSION

Hands are the the majority ordinary mode of broadcast of pathogens to patients and good give cleanliness can avoid physical condition care-linked infection and the spread of antimicrobial confrontation. Scientific evidence and ease of use support of herbal hand wash during patient care. It may be concluded that Herbal Hand wash has a significant microbial effect on the specified microorganisms. Thus, present is huge probable in establish the use of antimicrobial herbal goods as a determine to manage the multidrug opposed to bacteria as well as ensure their extend through hand from one physical area to another.

Herbal hand wash is based alternative for chemically prepared containing active silver nitrates. Natural herbal hand wash are effective, environment friendly, bio degreadale, inexpensive. In this research work herbal hand wash were formulated successfully.

The ph, irritancy, and spreadability were observed. For observe herbal hand wash activity microbiological test were performed in comaprrission test with standard; inhibition zone were calculated in mm. So from result it is concluded that prepared formulation of herbal hand wash were evaluated and gives antimicrobial activity.

Future prospects

In the present situation, it is apparent that whatever important the concerns and demands of the policy makers, health professionals and public may be, they do not, in any way, stop the increasing trend of using herbal medicines. As a result, herbal medicine-based Traditional Medicine . This trend of growing and widespread use of herbal medicines is likely to increase even further throughout the world in the coming years with more and more scientific evidence of their quality, efficacy and safety pending from the researchers.. community insist has also grown-up for proof on the safety, efficacy and quality of herbal products and TM/CAM practices. In order to allay these concerns and to meet public demands, extensive research on herbal medicines is needed to be undertaken not only for their great healthcare value but also for the commercial benefits.

REFERENCE

1. Vibha Porwal, A complete Study On special method Of origin From Guajava Leaves For remedial Various Health Problem, International Journal of Engineering study and application, Vol. 2, Issue 6, 2012.
2. BipulBiswas, Antimicrobial Activities of Leaf Extracts of Guava (Psidium guajava L.) on Two Gram-Negative and Gram-Positive Bacteria, International Journal of Microbiology, Volume2013.
3. Powar P. V., Formulation and Evaluation of Poly Herbal Anti-Bacterial Gel Based Hand Wash, Int. J. Pharm.Sci,Page 79 vol August 2015.
4. A. Mounika1, Vijayanand P., Formulation and evaluation of poly herbal hand wash gel containing essential oils, Int. J. of Pharmacy and Analytical Research,Vol-6, Issue 4 Oct Dec 2017.
5. Rasool Bazigha Kadhim.,formulation and evaluation of herbal handwash from matricaria chamomilla flowers extracts, IJRAP vol 2, 2011.

6. Noer Lailya, Retno Windya Kusumaningtyas., The Potency of Guava Psidium guajava (L.) Leaves as a Functional Immunostimulatory Ingredient,The Agency for The Assessment and Application of Technolgy ,issue 2015.

7. Abhishek sharma, reenu yadav, formulation and evaluation of herbal hand wash, world journal of pharmacy and pharmaceutical sciences, volume 5, issue 3,dec2015.