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FORMULATION AND EVALUATION OF HERBAL ANTISEPTIC - HEMOSTATIC SOLUTION

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Abstract:

Traditionally Used solutions for the treatment of Cuts , Open wounds ,Abrasions of skin , Incisions are only having the antiseptic (antimicrobial) activity but they do not stop the bleeding; hence to overcome this problem we are developed a formulation by formulating the number of batches by designing the 2^3 factorial design of herbals Azadirachta indica (Neem) ,Curcuma longa (Turmeric) and Acacia catechu (Kattha) to act as a antiseptic and hemostatic by applying solution on the cuts and wounds . The plants have been reported in the literature as having good antimicrobial, anti-inflammatory and Hemostatics (Astringent) Activity. The prepared formulation was evaluated for various parameters like appearance, colour, pH, Consistency, Viscosity and antimicrobial activity. The formulation of Batch# F4 was compared with the marketed preparation Betadine (5 % Povidone Iodine). It is a very good attempt to establish the herbal antiseptic-Hemostatic Solution containing Extracts of Azadirachta indica (Neem) ,Curcuma longa (Turmeric) and Acacia catechu (Kattha) . Antiseptic-Hemostatic Solution was successfully designed and developed after extensive manufacturing and evaluation process by specialized techniques for evaluation of antiseptic –hemostatic activity in vitro.

Keywords: *Azadirachta indica , Curcuma longa , Acacia catechu, Antiseptic, Hemostatic.*

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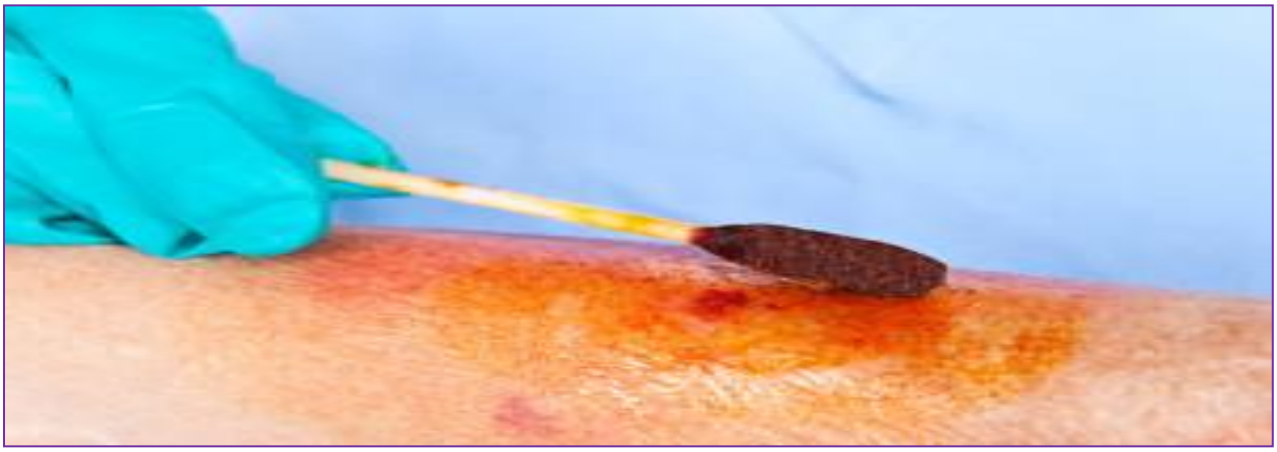
INTRODUCTION:

Products made from neem Oil and Turmeric extract have been used in India for over two millennia for their medicinal properties. Neem products are believed by Siddha and Ayurvedic practitioners to be anthelmintic, antifungal, antidiabetic, antibacterial, antiviral, contraceptive.It is considered a major component in siddha medicine and Ayurvedic and Unani medicine and is particularly prescribed for skin diseases. Neem leaves, Oil have also been used to treat skin diseases like eczema, psoriasis, etc. The heart wood and bark of the tree are used in traditional medicine. A wood extract called catechu is used in traditional medicine for sore throats and diarrhea. The concentrated aqueous extract, known as khayer gum or cutch is astringent .So we taken a advantage of its astringent property which precipitates the proteins at the time of bleeding and stops the bleeding from cuts and wounds. The antimicrobial activity of herbal drugs was tested individually by checking the zone of inhibition and the Aseptic conditions was maintained during the practicals.

Traditionally Used solutions for the treatment of Cuts , Open wounds ,Abrasions of skin , Incisions are only having the antiseptic (antimicrobial) activity but they do not stop the bleeding; hence to overcome this problem we are developed a formulation by formulating the number of batches by designing the2^3 factorial design of herbals *Azadirachta indica* (Neem) ,*Curcuma longa* (Turmeric) and *Acacia catechu* (Kattha) to act as a antiseptic and hemostatic by applying solution on the cuts and wounds .



MATERIALS AND METHODS:

Table 1: List Of Chemicals

Sr. No.	Name of the Ingredients	Category	Manufacturer / supplier
1	Azadirachta Indica Oil	Antimicrobial	Dagdu Teli Chandwadkar, Nashik
2	Curcuma Longa	Antimicrobial	
3	Acacia Catechu	Astringent	
4	Gum Acacia	O/W Emulsifying Agent	Oxford Laboratory Vasai
5	Methanol	Solvent	Oxford Laboratory Vasai
6	Water	Solvent	Distilled Water

Table 2: List of Instruments

Sr. No.	Name of the Instrument	Model/Manufacturer
1	Analytical weighing balance	Labline Analytical Balance ,Mumbai
2	UV spectrophotometer	Cary Win UV
3	Magnetic Stirrer	Remi Equipments, Mumbai.
4	Sonicator	Citizen.
5	Hot Air Oven	Thermolab, Mumbai.
6	Digital PH meter	Hanna Instruments
7	Stability chamber	Thermolab, Mumbai.

Table 3: Factorial design of batches for Optimization

Formulation code	Combination	Curcuma longa(A)	*Azadirachta Indica*(B)	Acacia Catechu(C)
F1	(1)	-	-	-
F2	A	+	-	-
F3	B	-	+	-
F4	AB	+	+	-
F5	C	-	-	+
F6	AC	+	-	+
F7	BC	-	+	+
F8	ABC	+	+	+

+ = At high level - = At low level

Table 4: Levels of Ingredients

Sr .no.	Name of ingredient	High level	Low level
1	Curcuma longa	10%	5%
2	Azadirachta Indica	10%	5%
3	Acacia catechu	10%	5%

A) Preparation of Emulsion :

- **Primary emulsion by dry gum method:** the mortar must be dry and with a rough rather than a smooth inner surface, trituration should be done in one direction and must be quick and uninterrupted until the primary emulsion is formed.
- During the preparation of the primary emulsion, the adequate amount of water should be add all at once otherwise a w/o primary emulsion will form, which cannot be converted into an o/w emulsion by subsequent dilution with water. If excessive amount of water is added, the viscosity of the aqueous phase will be too diluted, which will generally result in break down of the emulsion or cause other physical instability issues.
- The emulsion of Neem oil were prepared by using acacia gum as emulsifying agent and the vehicle is used a Aq. Extract of Acacia catechu and curcuma longa.

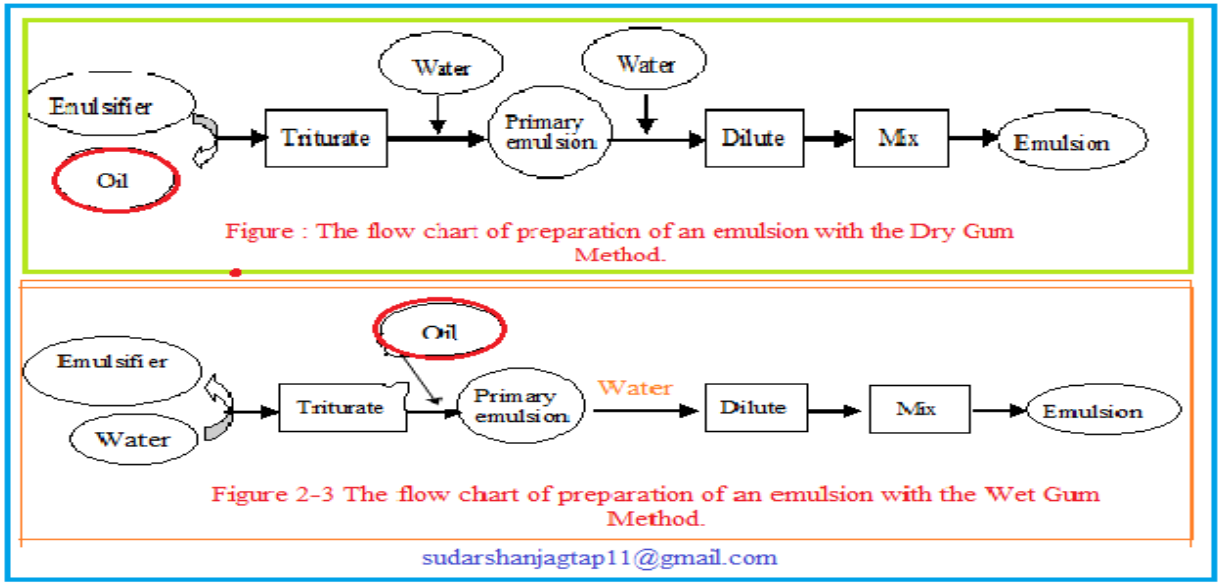


Fig 1: Difference Between Dry Gum Method and Wet Gum Method :

B) Evaluation of Formulated Solution:

- Colour
- odour
- Smooth texture
- Elegant in appearance
- p^H
- Antimicrobial Property
- Viscosity
- Hemostatic Property
- Compatibility
- Irritancy
- Evaluation of emulsion for stability etc.

1) Test of rheological properties

The viscosity of the preparation should be such that the product can be easily removed from the container and easily applied to the skin. Using cone and plate viscometer the viscosity of the preparation was determined.

2) Consistency :

- Should be smooth, no solid particles.

3) **pH:** The pHof dermatological ideally should be 6 to 8 in range and important to measure.

4) **Evaluation of antimicrobial activity :**

Azadirachta indica ,curcuma longa , acacia catechu were powdered . The antimicrobial activity of herbal drugs was tested individually by checking the zone of inhibition ant the Aseptic conditions was maintained during the practical's. Then nutrient agar medium was prepared according to given formula in literature. And pH 7.0 was maintained . the bores was prepared by borer at center of plate .then staphylococcus aureus was used as microorganism and spread over the plate, then the bores of plate filled with individual herbal drugs and incubated at 37 0C in incubator for 24 hrs. the zone of inhibition was observed and found that drugs having good antimicrobial property .

Nutrient Agar Medium :

A)beef extract ……..10 gm.

b) peptone……10gm

c) sodium chloride….5.0gm

d) Agar……..20gm

e) distilled water …1000ml

Table 5: Evaluation

Sr.no.	Test	Observation
1	Colour	Pale Brown
2	Odour	Characteristic
3	Consistency	Liquid
4	pH	6-8
6	Antimicrobial activity	Good

Working Procedure

Observations

plate – 01: Curcuma longa

Plate – 02: Control plate

Plate – 03: marketed standard

Plate – 04: Azadirachta Indica

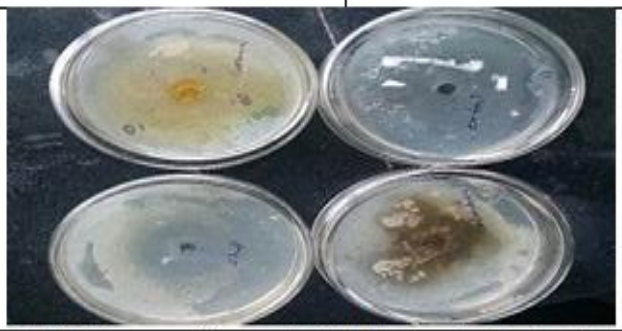


Fig 2. Images of (zone of inhibition) selective batches

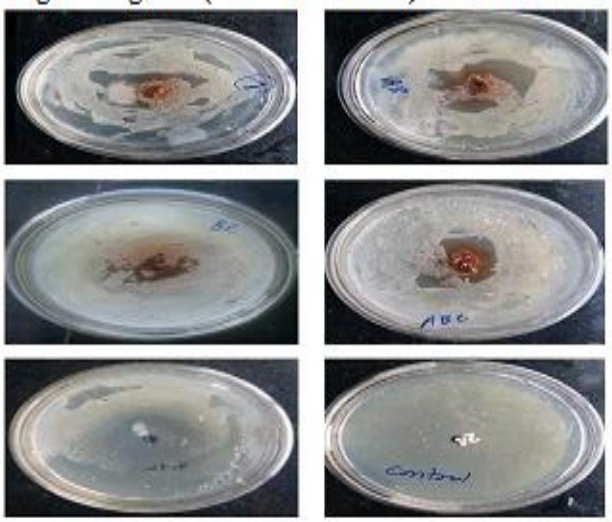


Table 6: Observation Table :

Sr.no.	Name of Sample	Zone of Inhibition (mm)	Name of medium used	Name of culture used	Inference
1	Azadirachta Indica	30	Nutrient agar medium	Staphylococcus Aureus	Antimicrobial property present
2	Curcuma longa	08			
3	Acacia catechu	07			
4	Marketed standard	15			
5	Control plate	-		-	-

Table 7: Observation (Sample of different batches)

Batch no.	Batch code.	Zone of inhibition in mm	Medium used	Culture used	Inference
F1	(1)	08	Nutrient agar medium	Staphylococcus aureus	F4 batch shows the maximum zone of inhibition
F4	AB	28			
F7	BC	10			
F8	ABC	19			
-	Standard	30			
-	Control	-		-	-

RESULT AND DISCUSSION:

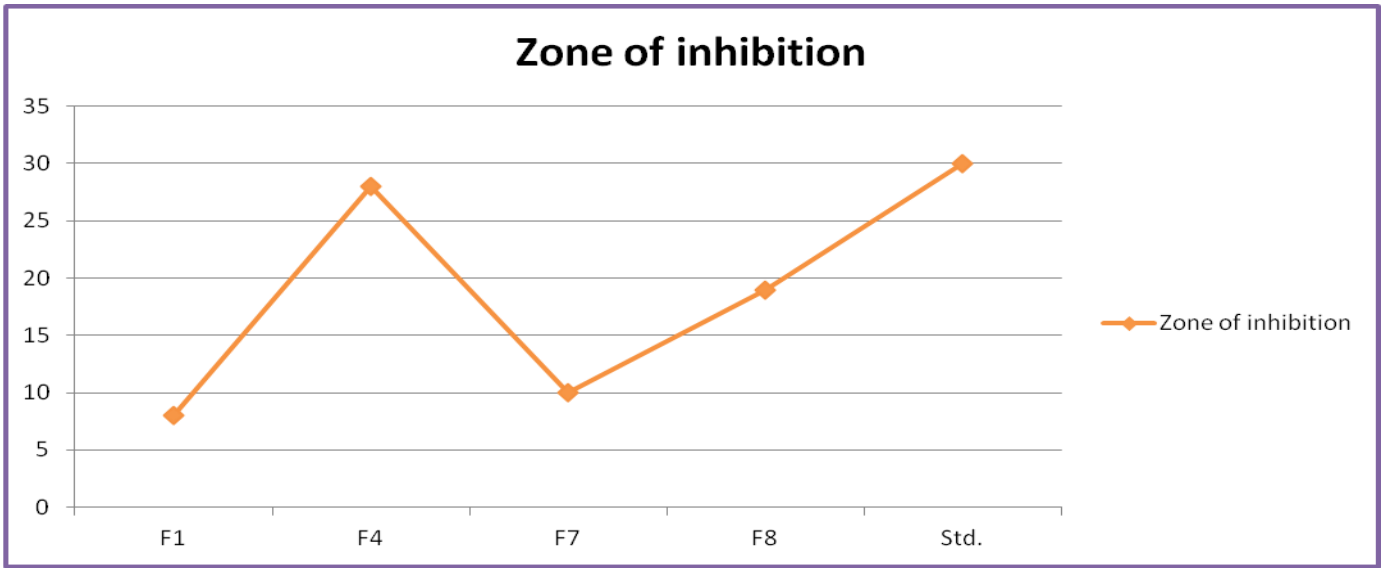


Fig.2: Zone of Inhibition

Formulation and evaluation of herbal antiseptic-Hemostatic solution was performed. Prepared solution was evaluated in terms of appearance, and found dark brown with characteristic odour were checked visually. pH of solution were checked pH analyzing antimicrobial activity it was found that newly developed herbal antiseptic solution had an inhibitory effect on the S.aureus. It also showed satisfactory zone of inhibition compared with control sample. It is based on natural source and showed zone of inhibition very close to Marketed Betadine and good hemostatic property due to Catechu so we can conclude that It has similar efficacy and safe to use as compared to synthetic (Betadine). In this way

Solution showed comparatively satisfactory antimicrobial activity thanMarketed sample.

The present study shows that newly developed polyherbal antiseptic was successfully designed developed and assessed its antimicrobial activity against control Betadine. Hence herbal Antiseptic could be used as better and safe substitution of synthetic Betadine

Traditionally it is said that turmeric when applied to face it improves the beauty and safe guard against number of skin diseases hence traditionally it is used in herbal cosmetics.The number of batches having different concentrations of herbal drugs was prepared and evaluated. We found that the F4 batch shows the excellent antimicrobial activity by testing all batches for zone of inhibition test.

CONCLUSION:

The Herbal Antiseptic showed good elegance and appearance. It is an excellent effort to design and develop the herbal antiseptic – Hemostatic solution having satisfactory zone of inhibition and antimicrobial activity comparable with control sample. the designed solution have a excellent antiseptic as well as hemostatic property. This study revealed that the developed herbal antiseptic – Hemostatic solution was suitable dosage form for antiseptic Hemostatic Activity.

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