



Formulation and Evaluation of Herbal Ointment Containing *Salacia oblonga* and *Curcuma longa* Extracts

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Abstract

The present study was carried out to prepare and evaluate herbal ointment comprising extract of *Salacia oblonga* and *curcuma longa*. The various types of formulation ointment base namely F1-F3 were formulated by incorporating wool fat, cetostearyl alcohol, hard paraffin and yellow soft paraffin. The pH, spreadability, stability, extrudability, etc. Herbal ointments containing hydro alcoholic seed extract of seeds of *Salacia oblonga* and rhizomes of *curcuma longa* was formulated and tested for antibacterial activities. The extract was incorporated into ointment base by melting the two phases. Topical application of hydro alcoholic extract of *Salacia oblonga* and rhizomes of *Curcuma longa* incorporated into ointment base and applied on the excision antibacterial activity.

Keywords

Herbal ointment, Levigation, Minimum Inhibitory concentration.

INTRODUCTION

Salacia oblonga

Indian system of medicine is one of the most ancient systems of traditional medicine and past 5000BC it has been practiced to offer natural ways to treat many diseases. Isolated pure compounds from the plant extracts, herbal extracts and herbal combinations have played important role in the prevention and management of diseases, especially in problematical chronic conditions. *Salacia* species (Family: Celastraceae) are widely distributed in Sri Lanka, India, China and other Southeast Asian countries, and many plants from this genus (e.g., *S. reticulata*, *S. oblonga*, and *S. prnoides*) have been used for thousands of years in traditional medicines. *Salacia* species has been used for the treatment of diabetes, obesity, rheumatism, gonorrhea and asthma. *Salacia oblonga* has a long history of use as a treatment for diabetes in Ayurveda, traditional Indian medicine. Mugs made from *salacia* wood are

used by people with diabetes to drink water. In addition to treating diabetes, *salacia* is used for treating gonorrhea, asthma, itchiness, joint pain (rheumatism), obesity, thirst, and menstrual problems.

Curcuma longa

Curcuma longa, or *Curcuma longa*, is a spice native to India. Historically, *curcuma longa* has been used throughout India, China and Indonesia as a spice and medicinal agent. *Curcuma longa* is a mild spice that enhances the flavour of other spices and foods and is the base of most Indian curries. Traditionally, *curcuma longa* has been used topically to heal and reduce bleeding associated with bruises, sprains, leech bites and inflamed joints. It has also been used internally for liver and digestive complaints, menstrual insufficiency and cramping, jaundice, and as an anti-inflammatory agent. In the Ayurvedic tradition, *curcuma longa*, or "haldi" as it is known in Hindi.

METHODOLOGY:

Plant Material Collection and Authentication:

The plant seeds of *Salacia oblonga* were purchased from Aditya Herbs, Delhi and dried rhizomes of *curcuma longa* were collected from the local area of Bhandara.

The plants of *Salacia oblonga* and *Curcuma longa* was authenticated by manufacturer Chemist Ms. Vijaya Wanjari, Hilarious Ayurveda, MIDC Mundipar, Gondia. The collected seeds and rhizomes were clean, washed and dried and used for further investigation.

Preparation of *Salacia oblonga* extract: -

Salacia oblonga plants were collected from the Western Ghats, India. The shade dried plants were separated into aerial and root parts and ground into a fine powder, using an electric blender. The phytochemical were extracted in ethyl acetate with help of

a soxhlet apparatus. The extract were concentrated, using a rota vapour and were stored at 20°C for further use.

Preparation of *Curcuma longa*: -

Dried rhizomes of *curcuma longa* were ground and the powder obtained was followed for extraction with 90% ethanol. The extract with crimson red colour was obtained and stored at cool and dark place in air tight container.

Powder analysis and physicochemical parameter:

Salacia oblonga:

It is bluish grey, fine, odour- tamarin like, powder with bitter taste. The powder microscopy reveals presence of multicellular covering glandular trichomes, anisocytic type of the stomata, cork cells, fragments of endocarp, fragments of xylem, testa, xylem vessel of Midrib.

Table No. 1:Physicochemical Parameter

TEST	LIMITS	RESULT
Total Ash %	NMT 5%	3.89%
Acid Insoluble Ash %	NMT 1%	0.63%
Alcohol Soluble Extract %	NLT 26%	28.8%
Water Soluble Extract %	NLT 4.0%	9.12%

NMT-Not More Than, NLT- Not Less Than

FORMULATION OF HERBAL OINTMENTS: -

Procedure for preparation of ointment base: -

Initially ointment base was prepared by weighing accurately grated hard paraffin which was placed in

evaporating dish on water bath. After melting of hard paraffin remaining ingredients were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment.

Table no. 2: Formulation of ointment base

Sr. No.	Name of the Ingredients	Quantity to be taken
1.	Wool fat	1gm
2.	Cetostearyl alcohol	1gm
3.	Hard paraffin	1gm
4.	Yellow soft paraffin	17gm

Procedure for preparation of herbal ointments: -

Herbal ointments were prepared by mixing accurately weighed *Salacia oblonga* and *Curcuma longa* extract base by levigation method to prepare a

smooth paste with 2 or 3 times its weight of base, gradually incorporating more base until to form homogeneous ointment, finally transferred in a suitable container.

Table no.3 Formulation of Herbal ointment

Sr. No.	Name of Ingredients	F1	F2	F3
1.	Prepared <i>Salacia oblonga</i> extract	0.11gm	0.12gm	0.13gm
2.	Prepared <i>Curcuma longa</i> extract	0.13gm	0.12gm	0.11gm
3.	Ointment base q.s.	20gm	20gm	20gm

It is yellowish-brown in colour, odour-characteristic, powder with characteristic with taste. The powder microscopy reveals the presence of outer cork, inner

cork, cortex, starch, fibres, oleo resin endodermis, vessel.

Table No.4:Physicochemical Parameter

TEST	LIMITS	RESULT
Total Ash %	NMT 9%	3.05%
Acid Insoluble Ash %	NMT1%	0.58%
Alcohol Soluble Extract %	NLT 8%	13.6%
Water Soluble Extract %	NLT 12%	16.4%

NMT- Not More Than, NLT- Not Less Than

EVALUATION OF OINTMENT-

1.Color and odour

colour and odour of prepared ointment was examined by visual examination.

2. pH

pH of prepared herbal ointment was measured by using digital PH meter. The solution of ointment was prepared by using 100 ml of distilled water and set aside for 2hrs. pH was determined in triplicate for the solution and average value was calculated.

3. Extrudability

The formulation was filled in collapsible tube container. The extrudability was determined in terms of weight of ointment required to extrude 0.5cm of ribbon of ointment in 10 seconds.

4. Diffusion study

The diffusion study was carried out by preparing agar nutrient medium. A hole board at the centre of medium and ointment was by placed in it. The time taken by ointment to get diffused through was noted. (after 60 minutes)

5. Loss On Drying (LOD):

LOD was determined by placing the formulation in petri-dish on water bath and dried for the temperature 105°C.

6. Solubility

Soluble in boiling water, miscible with alcohol, ether, chloroform.

7. Wash ability

Formulation was applied on the skin and then ease extend of washing with water was checked.

8.Non irritancy Test

Herbal ointment prepared was applied to the skin of human being and observed for the effect.

9.Stability study

Physical stability test of the herbal ointments was carried out for four weeks at various temperature conditions like 2 °C, 25 °C and 37 °C. The herbal ointments was found to be physically stable at

different temperature i.e. 2°C, 25°C, 37°C within four weeks.

ANTIBACTERIAL ACTIVITY:

The antibacterial activity of all the ointment containing extract was tested by well- diffusion using pour plate method against staphylococcus aureus (gram+ve) and Escherichia coli (gram-ve) obtained from department of microbiology of Dhote Bandhu Science College, Gondia.

Well- diffusion using pour plate method: -

Agar medium was prepared and autoclaved. 500 μ lit. Of inoculum was added in 250 ml of the media under aseptic condition and then media was poured in petriplates. After the medium was solidified wells were bored with help us sterile borer. The pH was adjusted between 7.8-8

Sample preparation: -

For the preparation of test sample of ointment solvent was used for dissolution. 1 gm of sample ointment were dissolved in 5 ml of Dimethyl sulphoxide and filtered. Thee sample in the form of solution were then used for the determination of antimicrobial activity. 60 mg, 80 mg, 100 mg/ml conc. were prepared Marketed 100 mg/gm betadine ointment were taken as standard 100 mg/ml concentration of betadine, solution was prepared. After that, to each plate one bore filled with 0.3 ml of betadine solution as reference and marketed accordingly.

To that other bore, 0.3 ml of ointment solution of 60 mg, 80 mg & 100 mg/ml were added respectively. In clockwise manner, in the labelled wells & incubated 32-37°C for 48hrs.

The sensitivity of test organism to each extract was indicated by clear zones of inhibition around the well & the diameter of the zone of inhibition was measured the test positive control & negative control was performed in duplicate.

RESULTS AND DISCUSION:

1) Characterization of ointment:

Test	Result
Color	Yellow
Appearance	Semisolid ointment

2) pH of the formulation-

Sr. No.	Batch	pH
1	F1	7.2
2	F2	7.0
3	F3	6.8

3) Extrudability: -

Sr. No.	Batch	Extrudability
1	F1	0.35gm
2	F2	0.40gm
3	F3	0.45gm

4) Diffusion study: -

Sr. No.	Batch	Diffusion study
1	F1	0.63cm
2	F2	0.60cm
3	F3	0.56cm

5) Loss on drying: -

Sr. No.	Batch	LOD
1	F1	20
2	F2	25
3	F3	30

6) Solubility: -

All the formulation is soluble in boiling water, miscible with alcohol, ether, chloroform.

7) Wash ability: -

Formulation was applied on the skin and then ease extend of washing with water was chek.

Sr. No.	Batch	Wash ability
1	F1	Good
2	F2	Good
3	F3	Good

8) Non irritancy Test: -

Herbal ointments prepared was applied to the skin of human being and observed for the effect.

Sr. No.	Batch	Non irritancy
1	F1	Non irritant
2	F2	Non irritant
3	F3	Non irritant

9) Stability study: -

Sr. No.	Batch	Stability study (2°C,25°C,37°C)
1	F1	Stable
2	F2	Stable
3	F3	Stable

10) Antibacterial Activity: -

The ointment shows maximum activity against E. coli as se en by zone of inhibition ranges from 12 ± 0.24 to 14 ± 0.5 mm.

The next response for inhibition activity was seen against S. aureus with ZOI ranges from 14 ± 0.23 to 18 ± 0.41 mm. However, the standard Betadine (10%)

shows significant ZOI against both the microorganism.

Concentration(mg/gm)	Gram Positive Staphylococcus aureus	Gram Negative Escherichia Coli
60mg/g	14±0.23	12±0.24
80mg/g	15±0.25	13±0.23
100mg/g	18±0.41	14±0.50
Bitadine 100mg/gm	20±2.10	18±1.90

CONCLUSION:

The Herbal ointments prepared was found to be good ointment characteristics with respect to consistency, extrudability, diffusion study, loss on drying, wash ability, stability study, microbial growth, antimicrobial activity.

Three ointment prepared using ethanolic extract exhibited strong antimicrobial activity and especially with 100 mg/g of the extract concentration in the ointment. The result of different chemical and physical tests of ointment showed that the formulation could be used topically in order to protect skin against damage caused by microorganism.

The Herbal ointments is used for their various medicinal properties like antibacterial, antifungal, anti-inflammatory activity.

Thus it can be concluded that there is a growing demand for herbal formulation in the world market and they are invaluable gift of nature.

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