

FORMULATION AND EVALUATION OF OINTMENT CONTAINING TURMERIC OIL

*Himani More and Shriniwas P. Patil

SCES's Indira College of Pharmacy, Pune-411033, India.

*Corresponding Author: Himani More

SCES's Indira College of Pharmacy, Pune-411033, India.

Article Received on 20/10/2020

Article Revised on 10/11/2020

Article Accepted on 01/12/2020

ABSTRACT

Since long back, topical formulations are used to treat inflammation and infection, using turmeric. These formulations could be traditional or modern ones. Looking at importance of turmeric oil as anti-microbial agent and different chemical constituents present in it, we formulated an ointment containing turmeric oil. Prior to use of oil, we evaluated it for different parameters as per Pharmacopoeia. We then formulated an ointment and evaluated its different properties.

KEYWORDS: *Curcuma longa*, curcuminoids, topical formulation, texture analysis.

INTRODUCTION

Turmeric (*Curcuma longa* L.) is a perennial herb, belonging to family Zingiberaceae, native to Southern Asia. It is one of the important, widely and traditionally used medicine for the treatment of various illnesses pertaining to microbial infection and related inflammatory diseases. It has significant wound healing potential. Phytochemical responsible for these activities

is curcumin, a curcuminoid present in its rhizomes. Apart from curcumin, rhizomes have essential oil in it, which contains α -phellandrene, δ -3-carene, eucalyptol, β -caryophyllene, β -farnesene, ar-curcumene, β -bisabolene, β -sesquiphellandrene, ar-turmerone, curlone (Singh et al. 2012) 1,8-cineole, β -cedrene, trepan, γ -terpinene, *p*-cymene, α -terpinolene, zingiberene (Sehgal et al. 2016) (Fig. 1).

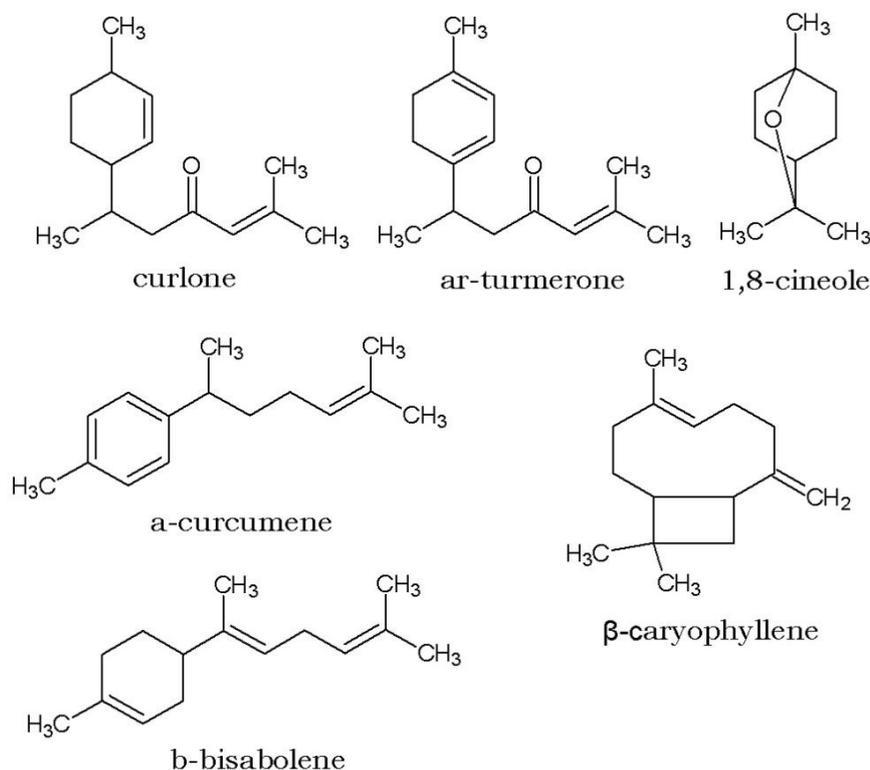


Fig.1: Chemical constituents present in Turmeric rhizomes.

So far, no attempt pertaining to formulation of any topical preparation containing turmeric oil was made. Therefore, the present research work was aimed towards formulation of ointment with turmeric oil and its evaluation for different parameters.

MATERIALS AND METHODS

Extraction of turmeric oil

About 100 gm of turmeric powder, purchased from local market was extracted with 500 ml of petroleum ether (b.p.60-80°C) using soxhlet assembly for 6 hrs. Then, solvent was recovered under reduced pressure using Rota evaporator and oil was collected. The oil was stored in air tight container till further use.

Evaluation of oil

Turmeric oil so collected was then evaluated for different parameters like Refractive Index, Specific gravity, Acid and Saponification values, as per procedures mentioned in Indian Pharmacopoeia 2014.

Preparation of ointment

For preparation of ointment, ingredients were used in concentration as mentioned in table no.1

Table No.1: Formulation of ointment.

Ingredient	Content (%)
Cholesterol	3
Cetosteryl alcohol	3
White wax	8
White petrolatum	86

Firstly, white petrolatum cetosteryl alcohol and white wax in required quantities were taken in beaker and melted in water bath at 80°C. Then, cholesterol was added to it and stirred for complete mixing. Finally, turmeric oil and clove oil were added and stirred for 15 mins.

Evaluation of ointment

Ointment so formulated was then evaluated for several pharmaceutical parameters.

Determination of pH

About 1 gm of ointment was added to 10 ml of water and its pH was checked on digital pH meter Equip-tronics model EQ-614.

Determination of skin irritation

Small quantity of ointment was rubbed on human skin and checked for irritation.

Determination of spreadability

About 1 gm of ointment was placed at the centre of a clear glass plate of size 10 and same another plate was carefully placed on it so that sliding was avoided and pressed with weight of 2 kg. After 3 mins, diameter of ointment spread on bottom glass plate was measured.

Viscosity

Viscosity of ointment was determined using Brookfield DV-E viscometer with spindle no. 61.

Texture analysis

Ointment was also studied for its texture using Texture Pro CT V1.3 Build 15 manufactured by Brookfield Engineering Labs, Inc. in triplicate.

RESULTS AND DISCUSSION

On extraction and subsequent solvent recovery, fluorescent yellowish turmeric oil was obtained. It was essential to evaluate the oil extracted. On Abbe's refractometer, refractive index of oil was recorded as 1.515. Specific gravity was found to be 0.924; indicating that turmeric oil is lighter than water. Acid and Saponification values of oil were found to be 2.1 and 181, respectively.

The pH of ointment was found to be 6.7, which is compatible with skin. On applying to skin, ointment was not found irritant. The spreadability of ointment was found to be 3 cm while the viscosity of ointment was found sufficient for its spreading on skin.

To determine mechanical, geometrical and surface attributes, Szczesniak, 1963 launched the concept of 'two-bite test' or texture profile analysis (TPA) which uses various protocols, one of which is one-deformation. One-deformation tests, here determined parameters such as firmness, 200 G; adhesiveness or cohesiveness, -300 G. Using instrument Texture analysers, all texture attributes could be determined by applying controlled forces to the semi solid formulation and recording its response in the form of force of deformation and time Fig 2.

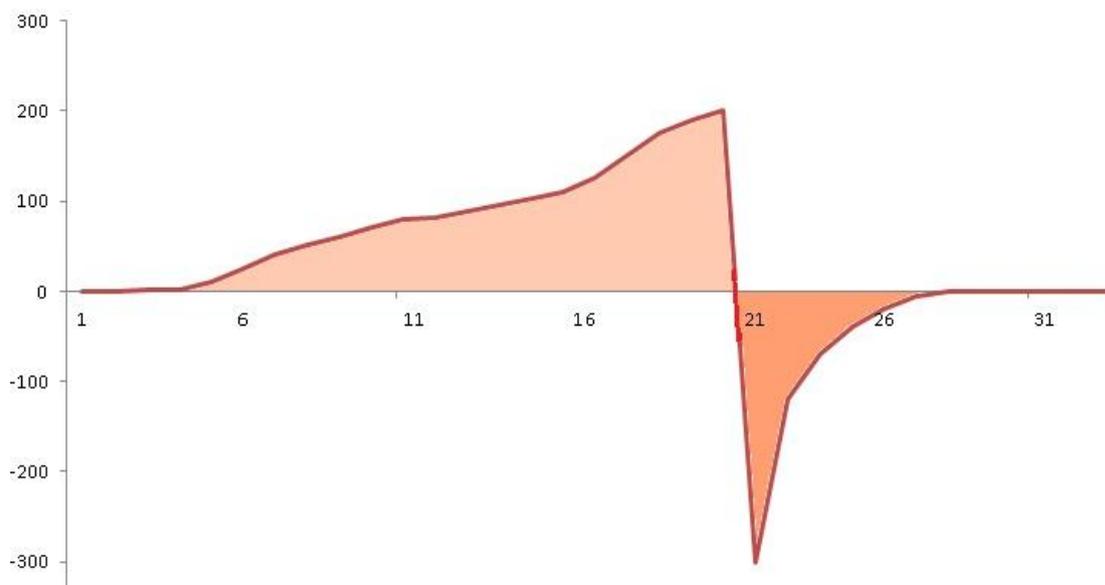


Fig.2: Texture analysis of ointment.

As such, these parameters do not have any fixed selection criteria or any pharmacopoeial or regulatory standards, but based on the requirements specific for particular product; these parameters can be characterized and standardized (Meher et al. 2013).

CONCLUSION

Turmeric oil has several pharmacological activities and can be formulated in ointment. Clove oil could be added as penetration enhancer for active ingredients of turmeric oil. Formulation of turmeric oil into ointment exhibited all the pharmaceutical evaluation parameters required for its efficient topical application.

REFERENCES

1. Singh S., Sankar B., Rajesh S., Sahoo K, Subudhi E. Nayak S. Chemical Composition of Turmeric Oil (*Curcuma longa* L. cv. Roma) and its Antimicrobial Activity against Eye Infecting Pathogens. *Journal of Essential Oil Research*, 2012; 23(6): 11-18.
2. Sehgal H., Tarun Jain T., Malik N., Chandra A., Singh S. 2016. Isolation and chemical analysis of turmeric oil from rhizomes. *Chemical engineering towards sustainable development*.
3. Indian Pharmacopoeia, Indian Pharmacopoeia Commission, Ghaziabad Ministry of Health and family welfare, Government of India, 2014; 1.
4. Szczesniak, A.S. Classification of textural characteristics. *J. Food Sci.*, 1963; 28: 285–9.
5. Meher JG, Yadav NP, Sahu JJ, Sihna P. Determination of required hydrophilic-lipophilic balance of citronella oil and development of stable cream formulation. *Drug Dev. Ind. Pharm.*, 2013; 39(10): 1540-6.