

Research Article

Development and Evaluation of A Herbal Anti-Acne Stick For Topical Application By Using Pomegranate Powder

Ms. Maya Yashwant Gaikwad^{1*}, Ms. Tejaswini Kailas Arote²

Assistant Professor, SMBT Institute of Diploma Pharmacy, Dhamangaon, Nashik, Affiliated to MSBTE, Maharashtra, India.

Student, SMBT Institute of Diploma Pharmacy, Dhamangaon, Nashik, Affiliated to MSBTE, Maharashtra, India.

ARTICLE INFO

ABSTRACT

Article history:

Received:17/02/2024

Revised:17/02/2024

Accepted: 19/02/2024

Key Words:

Acne vulgaris, *Anti acne formulation*, *Pomegranate seed*, *Acne prevention*, *Anti-inflammatory*.

Please cite this article

as: Gaikwad et al,
Development and
evaluation of A Herbal
Anti-Acne Stick For
Topical Application By
using Pomegranate
Powder 6(1), 6-9

Acne is one of the most prevalent dermatological concerns, often requiring long-term treatment. Conventional anti-acne formulations can cause side effects such as skin irritation and dryness, making herbal alternatives an attractive option. This study focuses on the development and evaluation of a herbal anti-acne stick incorporating pomegranate powder (*Punica granatum*) due to its antioxidant, anti-inflammatory, and antimicrobial properties. The stick formulation was prepared using natural ingredients such as beeswax, shea butter, coconut oil, and essential oils to enhance skin benefits. The developed formulation was evaluated for physicochemical properties, antibacterial activity against acne-causing bacteria (*Propionibacterium acnes* and *Staphylococcus aureus*), stability, and skin compatibility. The results demonstrated that the herbal anti-acne stick had an optimum pH (5.5–6.0), good spreadability, and a stable formulation. Antibacterial studies confirmed its significant efficacy in inhibiting acne-causing bacteria. Furthermore, skin irritation tests on volunteers showed no adverse reactions, indicating the formulation's suitability for topical application. These findings suggest that the developed herbal anti-acne stick is a promising alternative to synthetic treatments, offering a safe and effective herbal remedy for acne management.

©2024 Published by International Journal of PharmaO₂. This is an open access article.

* **Corresponding Author-** Ms. Maya Y. Gaikwad, SMBT Institute of Diploma Pharmacy, Dhamangaon, Nashik.

Email: gaikwadmau012@gmail.com Contact no.: 8010283764

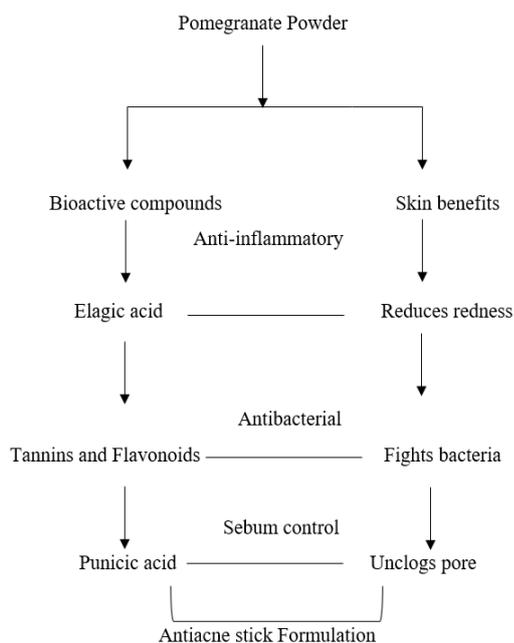
Introduction:

Now a day, in the whole world there is turn to return towards the use of herbal products and to adopt more natural way of life. People prefer natural food, herbal medicines and natural curing practices for healthy life; there is much craze for the vegetable products cultivated through biological/organic farming without using synthetic fertilizers and pesticides. (Verma *et al* 2017).

The anti-acne stick is a skincare product these acne stick is treat on the skin. It typically and making it easy to apply directly to problem area. These stick often contain active ingredients pomegranate powder, salicylic acid beeswax, cocoa butter, tea tree oil, coconut oil, vitamin E oil and stearic acid. Which work to reduce inflammation unclog pores and prevent future breakouts and to treat on pimples or acne spots. (Nagalakshmi *et al* 2017 and Mohammad *et al* 2014). The

acne is a common skin condition that affects individuals of all ages. The marketed available various treatment such as typical, creams gels and oral medication are available for managing acne or pimple. Easy to use treatment to manage their condition. An advantage of this drug delivery system includes patient compliance; convenience and comfort ness for efficient treatment include application without fingertip, immediate onset of action, reduced dosage regimen and economy. (Rao *et al* 2017).

Mechanism of action of Pomegranate powder to Antiacne stick formulation:



MATERIAL AND METHOD:

MATERIAL – 5 gm of pomegranate powder, Salicylic acid, Stearic acid, Bees wax, Coca butter, Tea tree oil, Coconut oil and Vitamin E capsule.

METHODS AND PREPARATION OF STICK

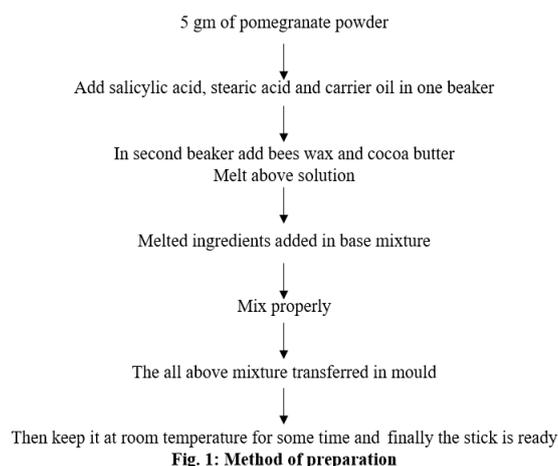


Fig. 1: Method of preparation

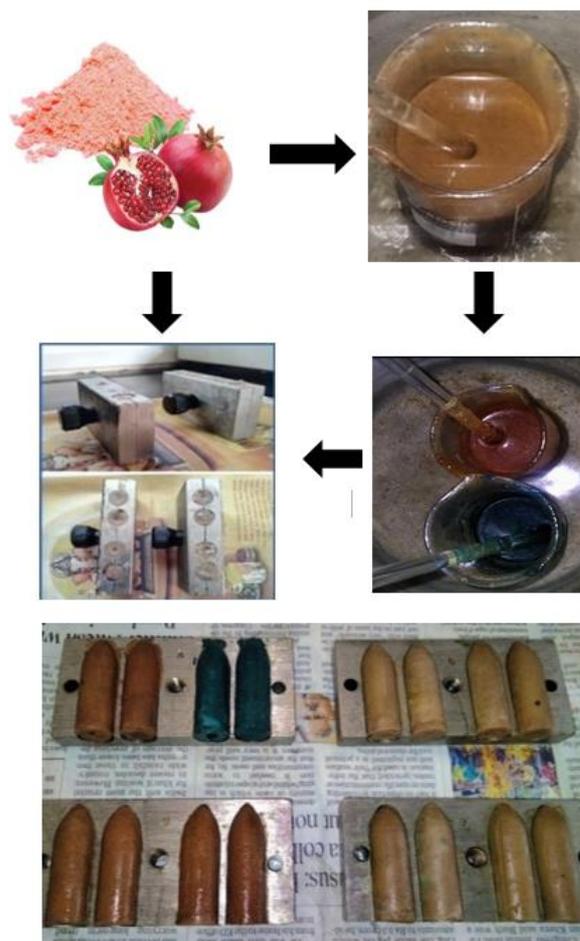


Fig. 2: Procedure for Antiacne stick formulation

Table 1: Formulation Table

Ingredient	F1	F2	F3	Role of Ingredient
Pomegranate powder(g)	5	5.2	5	Anti acne
Salicylic Acid(g)	1	1.0	1	Softening
Bees Wax	24	25	24	Help protect
Cocoe butter	19	20	19	Moisturizing
Coconut oil	14	15	16	Antioxidant
Vitamin E capsule	1	1.1	1.0	Clog pores
Stearic Acid	0.5	1	1	Cleansing agent

EVALUATION OF ANTI-ACNE STICK: (Mahakal *et al* 2021)

The evaluation involved weight, thickness, length, pH, spreading, washing, appearance, stability,

- Weight variation:** Three sticks were selected randomly and weighed individually. The individual weights were compared with the average weight for determination of weight variation. As the shape of the stick is cylindrical the thickness and length was determined with the help of screw gauge and vernier calipers respectively. The average thickness was measured, by observing thickness

at three different parts of the stick.

- Physical appearance:** The formulated sticks were visually inspected for colour, odour, solubility and appearance and reported.
- Melting point:** Determination of melting point is important as it is an indication of the limit of safe storage. The melting point of formulated sticks was determined by hot plate method sticks was kept in the apparatus and firstly observed the product was slowly melted. The above procedure was done 3 times and the melting point was observed in all formulations.
- Breaking Point:** Breaking point was done to determine the strength of the stick. The stick was held horizontally in a socket inch away from the edge of support. The weight gradually increased by a specific value (10gm) at specific interval of 30 sec and weight at which breaks was considered as the breaking point.
- Force of application:** It is a test for comparative measurement of the force to be applied for application. A piece of brown paper kept and stick was applied at a 45°C angle to cover a 1 sq. Inch Area until fully covered. The pressure reading is an indication of force of application.
- 8,6 Aging stability:** the products were stored in 40°C for 1 Hrs. various parameters such as bleeding, crystallization of on surface and ease of application were observed.
- pH measurement:** The small amount of sample was placed on a glass slide and the pH of the formulation was measured using a pH paper at Room temperature and the results were reported.
- Spreadability:** Spreadability is defined in terms of time in seconds required taken by the upper slide to slip off the stick placed between the two slides, under certain load. The lesser the time taken for the separation of two slides, the better the Spreadability: Take 500 mg of the formulation was sand witched between the two slides, each with dimensions of 6 x 2 cm. Then observed the Spreadability of the time taken by the upper slide to slip off the lower slide was noted.

$$\text{Spreadability} = m \times l/t$$
Where, m=weight tied to upper slide,
l=length of the glass slide (6 cm),
t= time in sec.

RESULT AND DISCUSSION -

Melting Point of Antiacne stick standard value is 40°C - 60°C

Table 1: Formulation Table

Sr. No	Solvent	Solubility
1	Water	Good
2	Methanol	Good
3	Ethanol	Very Good

Table 3: Evaluation parameters of formulated sticks

Sr. No.	Parameter	F1	F2	F3
1	Color	Light brown	Dark brown	Blue
2	Solubility	Ethanol	Ethanol	Ethanol
3	Melting point	45°C-55°C	40°C-50°C	45°C-50°C
4	Odour	Odourless	Odourless	Odourless
5	Weight Variation	Slightly	Slightly	Slightly
6	pH	4.5	5.5	6
7	Spread ability	Easily spread	Easily spread	Easily spread
8	Surface anomalies	Defect	No defect	Defect
9	Force of application	Good	Good	Good
10	Washability	Easily wash	Easily wash	Easily wash
11	Breaking point	30 sec	20 sec	30 sec
Sr. no	Parameter	F1	F2	F3
1	Color	Light brown	Dark brown	Blue
2	Solubility	Ethanol	Ethanol	Ethanol

RESULT AND DISCUSSION:

Anti - acne sticks prepared by heating and congealing method using salicylic acid, stearic acid, bees wax, cocoa butter, as stiffening agent. The pomegranate powder is used as antimicrobial agent cocoa butter and bees wax used as a hydrate and nourishment skin and antibacterial agent. The stearic acid and salicylic acid to treat as a skin moisturizing and to treat skin disorders, such as acne. A total 3 formulations were designed as medicated sticks preparation and evaluated for parameters like colour, odor, pH, spread ability, force of application, breaking point, washability and melting point etc. among three batches of formulation F2 batch shows good result.

CONCLUSIONS:

The present study successfully formulated and evaluated a herbal anti-acne stick incorporating pomegranate powder (*Punica granatum*), known for its antioxidant, anti-inflammatory, and antimicrobial properties. The formulation utilized natural ingredients such as beeswax,

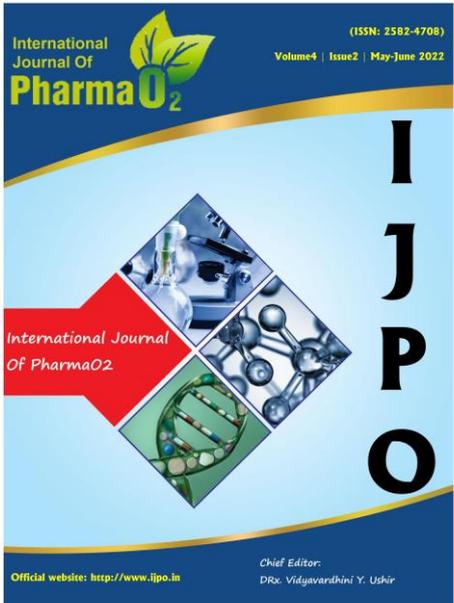
cocoa butter, coconut oil, vitamin E, and essential oils to enhance skin benefits and provide a safe, effective alternative to conventional anti-acne treatments. The anti-acne stick was prepared using the heating and congealing method, ensuring uniformity and stability. Three formulations (F1, F2, and F3) were developed and evaluated based on key physicochemical parameters such as weight variation, melting point, pH, spreadability, breaking point, and stability. Among them, F2 exhibited the most desirable characteristics, including an optimal pH of 5.5, good spreadability, a stable melting point (40°C–50°C), and ease of application. Solubility tests further confirmed its compatibility with ethanol, supporting its effectiveness for topical use. Compared to conventional acne treatments, which often cause dryness and irritation, this herbal anti-acne stick offers a natural and skin-friendly alternative. Its ease of application, stability, and therapeutic benefits make it a promising solution for acne management. Future studies focusing on extended stability testing, in vivo efficacy, and clinical trials will further validate its potential and pave the way for commercial production.

ACKNOWLEDGEMENT:

The authors acknowledge SMBT Sevabhavi trust, The Principal SMBT Institute of D Pharmacy for providing facility for completion of research work

REFERENCES:

- Mahakal, M. Kunjir, V. Solunke, R. et al. (2021). Formulation and Evaluation of an Anti acne Dermal stick. International journal of creative Research Thoughts, 9(4): 2320 – 2882.
- Mohammad, A. Rahim, B. Sima, N. (2014) Preparation and Pharmaceutical Evaluation of Nicotinamide stick for eradication of staphylococcus Epidermis. J Res Medical Science, 19 (7), 654-656.
- Nagalakshmi, R. (2017). Formulation and Evaluation of Medicated Analgesic Sticks, Indo American Journal of pharmaceutical Research, 7(9), 471-477.
- Rao, P. (2014). Design of Miconazole Derma Sticks for Treatment of Chromomycosis. World Journal of Pharmacy and Pharmaceutical Science, 3(4).
- Verma, S. & Tripathi, D. and Tiwari, R. (2017). Formulation and Evaluation of Natural Lipsticks prepared from Bixa Orellana seeds and Daucus Carota Root extract and their Comparative Study, Journal of pharmaceutical Science Bio Scientific Research, 7(1), 131-135.



IJPO is

- Peer reviewed
- Bi-monthly
- Rapid publication
- Submit your next manuscript at journalpharma02@gmail.com