

# Ethnopharmacological Studies of *Argemone Mexicana* for the Management of Psoriasis Followed By Molecular Techniques: Focus on Plant Metabolomics & Mechanism of Action



Mohammad Gayoor Khan, Yezdani Umama, Hari Baskar, Kumar Ayush, Karthikeyan Lakshman, Monika Sekar

**Abstract:** Psoriasis is an autoimmune condition which results in the body attacking itself. It occurs in the age group of 14 to  $\geq 65$  years. The average age is 28 years. More than 10 million cases per year in India are being recorded. Around 15% of cases emerge before the age of 10 years. In the case of psoriasis, white blood cells known as T cells mistakenly attack the skin cells. Around 80% of people have mild psoriasis, and the other 20% have moderate to severe psoriasis. There are different types of psoriasis they are Plaque psoriasis occurs in about 80-90% of people, it appears as raised, inflamed, red lesions, covered by a silvery, white scales, usually on the elbows, knees, scalp, and lower back. Inverse psoriasis appears in the different parts like armpits, the groin, under the breasts, and in other skin folds such as the buttocks and around the genitals. *Argemone Mexicana* (Mexican poppy, Mexican prickly poppy, flowering thistle, cardo or cardosanto) is a species of poppy found in Mexico and now widely naturalized in many parts of the world. An extremely hardy pioneer plant as it is tolerant of drought and poor soil, often being the only cover on new road cuttings or verges. The flower has bright yellow latex, and though poisonous to grazing animals and is rarely eaten, but has been used medicinally by many people including those in its native area, the Natives of the western US, parts of Mexico and in Whole part of India, Pakistan, Nepal, Bhutan, etc.

**Keywords:** Chromatographic and Spectrophotometric techniques, Psoriasis, *Argemone Mexicana*, Albino Mice, Etc

## I. INTRODUCTION

Psoriasis is a very common Tropical Neglected Disease in India more than 10 million cases per year are being observed. It causes the cell to build up rapidly on the surface of the skin and itchy or dry patches something painful.

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Psoriasis is chronic Disease it can be for years and lifetime lab test must be required Psoriasis treatments include steroid creams, occlusion, light therapy and oral medications, such as biologics. There are mainly five different types of psoriasis: plaque, guttate, inverse, pustular, and erythrodermic.

Psoriasis Diagnoses based on Patient Symptoms but if Person with Darker skin the patches may be purple in color. The skin can trigger psoriatic skin changes at that spot referred to as the “Koebner phenomenon “. Recently, the worldwide prevalence of psoriasis in adults ranged from 0.53 % to 13.43%. C-reactive protein (CRP) is a key biomarker of acute-phase systemic inflammation and risk for future vascular disease. It can be diagnosed by the elevated level of CRP which is used as a predictor of inflammation in different diseases, including psoriasis. It was found that the level of CRP increases with the increasing number of signs of metabolic syndrome. Psoriasis is referred to as a multisystem chronic disease connected to different co morbidities like obesity. Obesity is a relevant risk factor for the development and complication onset of non-communicable diseases.

**Signs and Symptoms:** Sometimes psoriasis cause itching on the affected part of the skin, nails, and scalp which is referred to Plaque Psoriasis which is most common Psoriasis, treatment may not scientifically proved but management is possible which is totally depends upon patient past records or Medical history. The goals of treatment are very few, less severe flare-ups. Light therapy: If the rash is more widespread, may treat it with ultraviolet light.

**Biologic drugs:** Another kind of systemic drug also targets your immune system. Biologic drugs used to treat psoriasis include adalimumab (Humira), etanercept (Enbrel), Brodalumab (Siliq), guselkumab (Tremfya), infliximab (Remicade), ixekizumab (Taltz), secukinumab (Cosentyx), and ustekinumab (Stelara). They're given either by a shot or through a vein in the arm. They have affect on specific type of immune cell or keep certain proteins from causing inflammation. But these drugs can make it harder to fight infection.

**Systemic drugs:** plaque psoriasis may need medicines that work throughout the body. They calm the immune system or make skin cells grow more slowly. But they cause serious side effects, such as depression, aggressive thoughts, liver problems, or a higher risk of skin cancer.

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**Plaque psoriasis:** Tropical treatments especially cream are first preference it helps to reduce skin inflammation and minimize cell growth in skin example includes Vitamin A, Vitamin D, Corticosteroid, etc.

Salicylic acid and coal tar also used in the management of psoriasis and few Natural ingredients for smooth itch like Aloe vera gel etc. Topical emollients that put on after a shower or bath can help keep the skin moist.



Figure 1.1 Psoriasis on sole of foot



Figure 1.2 Psoriasis on Palms

Psoriasis Vulgaris (which is also known as chronic stationary psoriasis or plaque-like psoriasis) is the most common form and affects 85%–90% of people with psoriasis. Plaque psoriasis is typically appeared as raised areas of inflamed skin covered with silvery white scaly skin. These areas are called plaques and are most commonly found on the elbows, knees, scalp, and back.

Psoriasis can affect the nails and produces a variety of changes in the appearance of finger and toenails which occurs in 40–45% of people with psoriasis affecting the skin and has a lifetime incidence of 80–90% in those with psoriatic arthritis. These changes include dent in the nails (i.e., pinhead-sized depressions) in the nails is seen in 70% with nail psoriasis.

## II. BACKGROUND

Plants are being used in traditional medicine for several thousand years. The knowledge of medicinal plants has been collected since many centuries based on different medicinal systems like (Ayurveda, Unani, and Siddha). It has been reported that traditional healers in India use 2500 plants species of plants and 100 species of plants serve as regular and continuing sources of medicine. In the last few decades, there has been increased interest in the study of medicinal plants and their traditional use in different parts of the world documenting the indigenous knowledge by ethno botanical

studies is an important aspect for the conservation and utilization of biological resources. The important thing is the World Health Organization (WHO) shows that as many as 80% of the World's people depends on traditional medicine for their preliminary health care needs. Major parts of the world's population in developing countries still relay plants for their primary healthcare systems to treat Psoriasis.

The Ethno pharmacological is the Ethno pharmacology (occasionally also called ethno pharmacy) is a related study of ethnic groups and their use of drugs. It is undoubtedly linked to medicinal plant use, ethno botany, as this is the main delivery of pharmaceuticals. It deals with the study of the pharmaceutical means considered in relation to the cultural contexts of their use, for example, *Argemone Mexicana* is used in Plaque and guttate Psoriasis. Ethno medicinal Plant *Argemone Mexicana* used for the treatment of Psoriasis diseases.

**The botanical name, family name & Plant characters -** *Argemone Mexicana* L. Papaveraceae Prickly, annuals, flowers bright yellow, fruits prickly with blackish-brown seeds.

**Local name, English name & Plant photo -** Mexican poppy, Mexican Prickly Poppy, Flowering thistle, Sathyanashi (Hindi) The name **Sathyanashi** is given because of its ability to successfully treat and cure diseases.



Figure 1.3



Figure 1.4



Tribes name - Meena & Gurjar, Bhil etc.  
Plant parts used & mode of use - Fresh plant sap and paste of root powder applied externally  
Districts/ Area- Madhya Pradesh, Uttar Pradesh, Rajasthan (Chhatarpur M.P, Kota, Bundi, Jhalawar Rajasthan)  
Remarks - Very effective in plaque and guttate Psoriasis.

### III. OBJECTIVE SELECTION OF ARGEMONE MEXICANA

1. To provide treatment that is natural with least side effects
2. To provide a better and effective treatment for the skin diseases like psoriasis.
3. Regulate a cost effective treatment.
4. To provide a treatment with less time duration.
5. To reduce the cost of treatment.
6. To increase the quality of life of the patient
7. To provide treatment which can easily be used by everyone.

#### A. Parameters:

- 1) Polaration of the scales.
- 2) Appearance of the scales.
- 3) Immunohistopathology.
- 4) Histopathology (skin).
- 5) Percentage % scales reduction.

#### B. Materials and Methods

HPTLC (High Performance Thin layer chromatography)

#### C. Study Design

This is the prospective study on randomly selected samples from patient of different age over a period of 3-4 months using analysis as a tool.

The Research will be conducted in Truba Institute of Pharmacy, Bhopal, Madhya Pradesh, India.

#### D. Methodology

Induction of psoriasis: psoriasis is Included among the wistar rates by the application of 5% imiquimod cream directly on the skin surface of the animal for 6-9 Days.

Induction of Psoriasis Model: The hairs from the back of the rates are removed using hair removing cream. 5% imiquimod cream is then applied gently over the surface for 6-9 Days.

This result in the development of the Psoriasis.

#### E. Collection of Data

1. The data is being collected from the previous reviews and is analyzed and then the experimentation will begin.
2. Data from the diseases patients.
3. Psoriasis Samples from various areas of Bhopal, Hyderabad India.

#### F. Inclusion Criteria

1. Patients with skin infections.
2. Patients with chronic diseases.
3. Patient requiring for long term therapy.
4. Patient of every age group.
5. Patients with recurrent hygiene routine.

#### G. Exclusion Criteria

1. **Species / common name :-** Albino Mouse

2. **To targets the mechanism of action:** focus on Yeast based model protocols along with preclinical studies on animals.

### MANAGEMENT OF PLAQUE PSORIASIS :( A New Approach) FORMULATION OF CREAM 20 MG USING EXTERNALLY IN MANAGEMENT OF PLAQUE PSORIASIS

**Materials required** – salicylic acid, aloe vera gel, distilled water, argemone Mexicana.

#### Procedure –

5% Salicylic acid, 5 Mg Aloe vera gel, Distilled water, Prepared Thick gel from root Argemone mexicana as per followed standard Guideline of Indian Pharmacopoeia Commission.

**Dosing and dosage form** – Twice a days, externally applied on marks.

**Side Effects** – There are no side-effects observed in 3 months study.

Although it has not been clinically proven cure of psoriasis but this formulation helps in its management and minimizes the psoriasis in its early stage.

### IV. RESULT

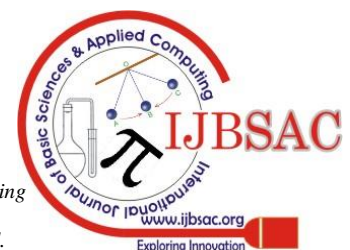
The present study documented an Argemone Mexicana plant commonly used by the indigenous people of Rajasthan as anti-psoriatic. The findings documented in Figure 1.3 to Figure 1.4 and for easy identification of used plants, their photographs have also been given. Hence, this research proves that Argemone Mexicana can be used in the management and treatment of psoriasis in a more effective way and with minimum side effect at a minimal cost to the patient.

### V. CONCLUSION

Natural medicines such as herbal medicines are a safer mode of therapy because of its presumed lack of adverse side effects. The value of medicinal plants as herbal remedies is being lost due to lacking of awareness, and deforestation. There are more than 19 Types of Natural medicine Plant including Argemone Mexicana, Adiantum incisum, Adiantaceae, Aloe vera, Annona squamosa L, Aristolochia bracteolata, Cannabis sativus, Capsicum, Cassia auriculata, Holoptelea integrifolia, Momordica charantia, Ocimum canum, etc are helpful in the management of Six Different types of Psoriasis Naturally. first Government Or state government should implement take immediate action to Preserve the knowledge of medicinal Plants species and herbal remedies for the overcome of side effects it is very essential and it also helps in Homeopathic, Unani, Ayurveda, Siddha, and Allopathic Formulations.

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program and involved in many social activities in the villages and government schools under NSS (National Service Scheme). He won cash prize in academic excellence for two years. His current project was selected and funded by TANSCST (Tamilnadu State Council for Science and Technology) and published a research article. Awarded cash prize for his excellent performance in ALL INDIA PHARMACY QUIZ. He got Frist prize in poster presentation in National Pharmacy Week organized by ISTE. He cracked GPAT (Graduate Pharmacy Aptitude Test). He was awarded many prizes in sports meet. His research areas include Molecular Docking, Proteomics, Genomics, Combinatorial Chemistry etc. He attended more than 5 National conferences, 4 workshops and 1 International summit.



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