ETHNONOMEDICINAL IMPORTANT PLANTS OF RAJASTHAN USED IN THE TREATMENT OF PSORIASIS DISEASES

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ABSTRACT
The present paper deals with 26 ethnomedicinal plant species belonging to 19 families used as antipsoriatic by the indigenous people in Rajasthan. The study also deals with types of Psoriasis, plant name, local name, family, plant parts and mode in the treatment of psoriasis. The present study also gathered important information about traditional knowledge and the need to document, research and development of new drugs to fight against Psoriasis disease in Rajasthan.

KEYWORDS: Psoriasis, Plaque, Guttate, Pustular, Inverse, Erythrodermic, PSA, Phytochemicals, Phototherapy.

INTRODUCTION
Psoriasis is a chronic and inflammatory recurrent dermatosis disease frequently affecting the skin, nails, lumbosacral areas, intergluteal cleft, glans penis, knees, scalp, palm/soles of feet & joints. Persons of all ages may develop this disease/disorder. In World between 2 to 4 % of the general population is affected with psoriasis. It affects one in 50 persons. It is grouped under the “Papulosquamous disorder”.

The most typical lesion is well demarked in pink coloured plaque covered by loosely adherent scales that are characteristically silver white in colour. Disease onset in early admitted due to genetic transmission and more than a dozen immune modifying biological agents. In nut shell, psoriasis is a common skin condition where the skin develops areas that become thick covered with silvery scales.
Psoriasis is considered a skin disease, but really, it is a disordered immune system. The T-cells, a type of White Blood Cells (WBC) become over stimulated. Psoriasis tends to be worst in those with a disordered immune system for other reasons (Cancer, AIDS, other autoimmune diseases).

There are six types of Psoriasis: 1. Plaque, 2. Guttate, 3. Inverse, 4. Pustular, 5. Erythrodermic & 6. Psoriatic Arthritis (PSA). *(Fig.1)*

1. **Plaque**: It frequently occurs on skin of elbow and knee and also could occur at any area of body. In this case skin lesions are red at the base and covered by silvery scales.

2. **Guttate psoriasis**: Small drop shaped-lesions appear on trunk, limbs & scalp. This type of psoriasis is triggered by URI (Upper Respiratory Inflections).

![Fig.1: Types of Psoriasis disease](image)

3. **Pustular psoriasis**: Blisters of non-infection pus appears on the skin. Such type of Psoriasis may be triggered by medications, infections, stress, exposure to certain chemicals.

4. **Inverse Psoriasis**: Smooth, red patches occur in the folds of the skin near the genitals, under the brest and in the armpits. The symptoms may be very severe by friction and sweating.

5. **Erythrodermic Psoriasis**: It is widespread reddening and scaling of the skin may be reaction to severe sunburn or to taking corticosteroids (cortisone) or prolonged period of increased activity of psoriasis.

6. **Psoriatic Arthritis (PSA)**: Joint inflammations that produce symptoms of arthritis in patients who have all will develop psoriasis.
TREATMENT OF PSORIASIS

Doctors mostly treat psoriasis a steps based on severity of disease, size of areas involved, types of psoriasis and patient’s response to initial treatment such type of treatment known as “1-2-3” approach.

Step 1: Skin has been treated with medicines (topical treatment).
Step 2: Uses light treatment (Phototherapy).
Step 3: In step three involves medications by mouth or injections, which treats the whole immune system (systemic therapy).

In broad sense, the treatment of psoriasis may be divided in four and summarized in picture form (Fig 2).

Herbal/Ethnomedicinal plants treatment

Ethanobotany is the branch of Botany, which deals the systematic study of the inter-relationship between people and plants. Major parts of the world’s population in developing countries still relay plants for their primary healthcare systems to treat various ailments.\textsuperscript{[1,12]}
Natural medications such as herbal medicines are a safer mode of therapy because of its presumed lack of adverse effects. In general, herbal formulations are less expensive than the above therapies and are known to minimize the risk of side effects, they therefore provide viable alternative for psoriasis management. Several herbal formulations are in clinical use in the Indian system of traditional medicines to treat skin diseases, but they are often undocumented and not clinically or scientifically validated. There are increasing research affords to develop herbal formulation to treat psoriasis, and there is a continuing need to develop herbal formulations to treat psoriasis effectively with minimal or no side effects. Therefore, it is the current need to develop medicines with no side effects. In this regard, the herbal/ethnomedicinal plants provide the best solution. Nature has provided the mankind with immense treasure since the dawn of Asia times. The herbs and medicinal plants provide an array of broad spectrum of activity. It was felt that the use of such medicinal plants would be beneficial for treating different skin ailments e.g. eczema, itching psoriasis. There are many research and review papers have been published recently as anti psoriasis. The important one are: Sarsaparilla (*Smilax officinalis*) as a treatment for psoriasis\(^4\), the anti-psoriasis and phytochemical evaluation of *Thespesia populnea* bark extracts\(^11\), screening of *Wrightia tinctoria* leaves as anti-psoriatic\(^3\), *Cassia tora* L. cream as anti-psoriasis in rats\(^6\), effect of indigenous medicinal plant extracts on psoriasis\(^2\), action soap misca-mates in the treatment of psoriasis\(^10\) and use of pure gel of *Aloe vera* in the treatment of psoriasis\(^13, 14\) (http://www.miracleplant-aloe-vera.com/psoriasis.treatment.html). Recently few review papers on alternative medicine for psoriasis\(^7\) and *Urginea indica* and its role in psoriasis\(^5\) have been published. A very exhaustive and detailed study of Ethnobotany of Rajasthan\(^9\) have also delt for the treatment of psoriasis and BSI has also published Flora of Rajasthan in three volumes.\(^8\) By the perusal of above, literature and survey of internets and field survey in tribal prone areas in the Aravalli forest range and desert in Rajasthan the authors felt great need to published important indigenous medicinal plants can be used as anti-psoriatic activity for the treatment of this disease in Rajasthan. The 26 plant species belonging to 19 families occurring in Rajasthan have been tabulated (*Table 1*) showing plant name, family, plant characters, local name, tribes, plant parts and mode of use, occurrence in districts and remarks. The following plant species *viz* *Adiantum incisum* Forssk., *Adiantum lannulatum* Burm., *Aloe vera* (L.) Burm.f., *Annona squamosa* L., *Argemone mexicana* L., *Aristolochia bracteolata* Lam., *Azadirachta indica* A. Juss., *Cannabis sativus* L., *Capsicum annum* L., *Cassis auriculata* L., *Cassia occidentalis* L., *Cassia tora* L., *Holoptelea integrifolia* (Roxb.) Planch, *Leptadenia pyrotechnica* (Forssk.) Decne., *Momordica charantia* L., *Nerium
oleander L., Ocimum canum Sims., Oxalis corniculata L., Pongamia pinnata (L.)Pierre, Psoralea corylifolia L., Protasparagis racemosus (Willd.) Oberm., Senna alata (L.) Roxb., Solanum nigrum L., Thespesia populnea (L.) Soland. & Corr., Urginea indica (Roxb.) Kunth. and Wrightia tinctoria R. Br. The plant specimens collected by Dr. K.S. Nama & Isha Pandey have been deposited in the herbarium of Career Point University, Kota. The specimens have been identified and confirmed by Dr. R.P. Pandey, Ex-Scientist-D & Head of Office, BSI, AZRC, Jodhpur.

STUDY AREA
Rajasthan is situated in the North-Western part of India between 23° 03’ and 30° 12’ N latitude and 69° 30’ and 78° 17’ E longitude, occupying an area of about 3,42,239 sq km. The elevation of land surface varies from 214 to 1727 m. In shape, it is an irregular rhomb with North-South and East-West diagonals, the former about 784 km and latter 850 km long. The Western and N-W boundaries are marked by Pakistan. In the North and N-E, it is bounded by Punjab, Haryana & UP, in the East and S-E by MP and in the S-W by Gujarat states in India. The remarkable feature of Rajasthan state is the Aravalli range, travelled 550 km from Khetri in N-E to Khed-Brahma in the S-W and elevation raises upto 1727 m at Mt. Abu. Aravalli range divides the whole of Rajasthan into two natural divisions i.e. 3/5 lying on N-W and 2/5 on the East and S-E. The Western sandy plains known as Rajasthan desert, comprising 1,96,150 sq km. The Eastern 1/3 part lying between sandy and plains in the West and the Aravalli in the East is semi-arid transitional plains. The Eastern plains covers the N.E. ans S.E. of the main Aravalli range. The area falling between Banas and Chambal rivers is called the Vindhyan scarpland extending over Bharatpur, Dholpur and Sawai Madhopur districts.

MATERIAL AND METHODS
Since last three years, many Botanical collection tours have been undertaken to collected ethnomedicinal information on anti-psoriatic plants in Rajasthan. The information collected includes plant name, local name, family, plant characters, tribes plant parts used, mode of use, distribution and remarks (Photos: 1 to 16).

RESULTS
The present study documented a total of 26 plant species belonging to 19 families commonly used by the indigenous people of Rajasthan as anti-psoriatic. The findings documented in Table 1 and for easy identification of used plants, their photographs have also been given.
Table 1: Ethnomedicinal important plants used by indigenous people in Rajasthan for the treatment of Psoriasis diseases

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Botanical name, family name &amp; Plant characters</th>
<th>Local name, English name &amp; Plant photos</th>
<th>Tribes name</th>
<th>Plant parts used &amp; mode of use</th>
<th>Districts/Area</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adiantum incisum Forssk.</td>
<td>Hansraj, Sanjeevini-Buti (Photo:1)</td>
<td>Bhil &amp; Gurjar</td>
<td>The fresh juice of the leaves apply externally.</td>
<td>Kota, Mt. Abu, Pali &amp; Udaipur</td>
<td>Very effective in Pustular and inverse Psoriasis.</td>
</tr>
<tr>
<td>2</td>
<td>Adiantum lannulatum Burm. Adiantaceae</td>
<td>Hansraj, Walking Maiden hair fern</td>
<td>Bhil, Damor &amp; Gurjar</td>
<td>The fresh juice of the leaves apply externally.</td>
<td>Kota, Mt. Abu, Pali &amp; Udaipur</td>
<td>Very effective in Pustular and inverse types of Psoriasis.</td>
</tr>
<tr>
<td>3</td>
<td>Aloe vera (L.) Burm. Liliaceae</td>
<td>Gheeganwar, Ganwarpatla, Barbados Aloe, True Aloe, Kumarpud (Photo:3)</td>
<td>Bhil &amp; Garasia</td>
<td>Leaves sap or juice taken orally and rub on the effected parts of body as gel.</td>
<td>Western Rajasthan, Banswara, Pali &amp; Udaipur</td>
<td>Plant pulp taken orally increase immune system of body, juice as gel over the body as a film to heal the wounds and lower the inflammation.</td>
</tr>
<tr>
<td>5</td>
<td>Argemone mexicana L. Papaveraceae</td>
<td>Pilawala dhatura, Pili Katia, Mexican poppy, Mexican prickly Poppy, Flowering thistle (Photo:5)</td>
<td>Bhil, Meena &amp; Gurjar</td>
<td>Fresh plant sap and paste of root powder applied externally.</td>
<td>Bundi, Jhalawar, Kota, Pali &amp; Udaipur</td>
<td>Very effective in plaque and guttate Psoriasis.</td>
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<tr>
<td>6</td>
<td>Aristolochia bracteolata Lam. Aristolochiaceae</td>
<td>Hukka bel, Kirramar, Kalipaad, Indian birthwort (Photo:6)</td>
<td>Bhil, Saharia, Garasia &amp; Gurjar</td>
<td>The fresh leaf juice with vegetable oil apply externally.</td>
<td>Bundi, Bara, Dungarpur, Kota, Mt. Abu, Pali &amp;</td>
<td>Very effective in all type of Psoriasis.</td>
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</tbody>
</table>
| **7** | **Azadirachta indica** A. Juss. *Meliaceae*  
Tall, evergreen trees, with compound leaves, flowers white or pale yellow and 1-seeded, yellow fruits. | Neem, *Indian Lilac, Margose tree*  
(Photo:7) | Bhil & Meena  
The paste of stem bark and leaves applied externally and early blooming flowers with water taken orally.  
Alwar, Banswara, Barmer, Dungarpur Jhalawar, Kota, Pali & Udaipur  
Very effective in all types of Psoriasis. |
| **8** | **Cannabis sativus** L.  
*Cannabinaceae*  
Annual, pubescent, aromatic herb, with compound leaves, flowers creamish-white and fruits compressed, straw. | Bhang, Charas, Ganja, *Soft Hemp, True Hemp*  
(Photo:8) | Bhil, Meena, Garasia, Damor, Kathodi, & Gurjar  
The paste of dry leaves, plant sap & fruit powder smear over the body also smoked (dry leaves) and Bhang, Charas (regin) taken orally for relief.  
Throughout Rajasthan State  
Very effective in inverse Pustular psoriasis and Psoriatic Arthritis (PSA). Due to anti-inflammatory properties of its cannabinoids - as drug. |
| **9** | **Capsicum annuum** L.  
*Solanaceae*  
Annual or biennial herbs, with dull white flowers and multi-coloured, pungent & many seeded berries. | Mirch, Mirchi, *Purple, red, yellow green Chilli and Chilli*  
(Photo:9) | All tribe  
Paste of dry leaves applied externally  
Western Rajasthan  
Effective in plaque Psoriasis. |
| **10** | **Cassia auriculata** L.  
*Caesalpinioideae*  
Bushy shrub, with compound leaves bright flowers and brown pods. | Anwal, Tarwan, *Tanners Cassia, Avaram*  
(Photo:10) | Garasia & Saharia  
Root powder paste with vegetable oil smear over the affected parts.  
Chittorgarh, Kota, Pali, Sirohi & Udaipur  
Effective in PSA & Guttate type of Psoriasis. |
| **11** | **Cassia occidentalis** L.  
*Caesalpinioideae*  
Diffuse undershrub, with 3-6 pairs of leaflets and yellow flowers. | Kesundo, Maripumbadio, *Coffee senna*  
(Photo:11) | Bhil & Garasia  
Paste of leaves apply externally  
Banswara, Pali & Udaipur  
Effective in all type of Psoriasis. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Family</th>
<th>Description</th>
<th>Tribe</th>
<th>Region</th>
<th>Treatment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td><em>Cassia tora</em> L.</td>
<td><em>Caesalpinia</em>ceae</td>
<td>Undershrub, with yellow flowers and linear pods.</td>
<td><em>Puaria, Talka chakundra, Fœtid cassia, The Sickle senna, Wild senna</em></td>
<td>Garasia</td>
<td>Pali &amp; Sirohi</td>
<td>The fresh decoction of leaves &amp; seeds taken orally and paste apply externally.</td>
<td>Effective in all type of Psoriasis. The cream made by methanolic extract of leaves applied externally act as anti-psoriatic (6).</td>
</tr>
<tr>
<td>13</td>
<td><em>Holoptelea integrifolia</em> (Roxb.) Planch.</td>
<td><em>Ulmaceae</em></td>
<td>Deciduous tree, with yellowish flowers and winged fruits.</td>
<td><em>Papri, Kanjeri, Churil, Indian Elm, Entire leaved elm tree</em> (Photo:13)</td>
<td>Bhil &amp; Garasia</td>
<td>Pali, Sawai Madhopur &amp; Udaipur</td>
<td>The paste of fresh tender leaves applied externally.</td>
<td>Effective in all type of Psoriasis. The cream made by methanolic extract of leaves applied externally act as anti-psoriatic (9).</td>
</tr>
<tr>
<td>17</td>
<td><em>Ocimum canum</em> Sims.</td>
<td><em>Lamiaceae</em></td>
<td>Perennial aromatic undershrubs, flowers white and seeds ovoid.</td>
<td><em>Tulsi, Bapchi, Van-Tulsi</em></td>
<td>All tribal people of the state</td>
<td>Throughout the State</td>
<td>Fresh leaf-paste apply, externally in parasitical skin diseases.</td>
<td>Very effective in Pustular and inverse types of Psoriasis.</td>
</tr>
<tr>
<td>18</td>
<td><em>Oxalis corniculata</em> L.</td>
<td><em>Oxalidaceae</em></td>
<td>Annual, creeping herbs, with 3-foliolate leaves, yellow flowers and</td>
<td><em>Khatri-butli, Khataria, Khati</em></td>
<td>Bhil, Meena, Damor, Saharia &amp;</td>
<td>Banswara, Bundi, Jhalawar, Kota, Pali &amp;</td>
<td>The fresh plant sap apply externally.</td>
<td>Very effective in plaque Psoriasis.</td>
</tr>
<tr>
<td></td>
<td><strong>Species</strong></td>
<td><strong>Family</strong></td>
<td><strong>Description</strong></td>
<td><strong>Uses</strong></td>
<td><strong>Preparation</strong></td>
<td><strong>Preparation</strong></td>
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<tr>
<td>19</td>
<td><em>Pongamia pinnata</em> (L.) Pierre <em>Fabaceae</em></td>
<td></td>
<td>Spreading evergreen trees, with compound leaves, flowers pinkish-white or pinkish-purple and obliquely-ovoid, wood, brown fruits.</td>
<td></td>
<td>Karanj, Kanja, Papra <em>Pongam oil Tree, Indian Beech.</em> (Photo:19)</td>
<td>Gurjar</td>
<td>Kathodi &amp; Garasia</td>
<td>Seed oil apply externally.</td>
</tr>
<tr>
<td>20</td>
<td><em>Psoralea corylifolia</em> L. <em>Fabaceae</em></td>
<td></td>
<td>Annual herb with simple suborbicular leaves, flowers bluish-purple and fruits 1-seeded.</td>
<td></td>
<td>Bakhni, Bavechi</td>
<td>Gurjar</td>
<td>Bhil, Gurjar &amp; Garasia</td>
<td>Fresh leaves and fruits decoction taken orally &amp; fruits paste smear externally.</td>
</tr>
<tr>
<td>21</td>
<td><em>Protaspargus racemosus</em> (Willd.) Oberm. <em>Asparagus racemosus</em> (Willd.) <em>Liliaceae</em></td>
<td></td>
<td>Spiny, branched, climbers with linear-falcate cladodes, flowers white, fragrant and fruits globose, red. The white tuberous roots are edible.</td>
<td></td>
<td>Sat Mooli, Satawari, Satawari, Safed musali, Vankanto (Photo:21)</td>
<td>Kathodi, Bhils &amp; Garasia</td>
<td>The dry tuberous root powder taken orally in the form of “Halwa” to improve body immune power and smearing of fresh root paste on the effected body parts.</td>
<td>South &amp; Western Rajasthan</td>
</tr>
<tr>
<td>22</td>
<td><em>Senna alata</em> (L.) Roxb. <em>Cassia alata</em> L. <em>Caesalpinia</em> <em>Caesalpiniaceae</em></td>
<td></td>
<td>Shrub, flowers yellow and fruits, longitudinally winged.</td>
<td></td>
<td>Dasmardan, Senamukhi, Candlestick Senna, Ringworm Cassia, Candle bush, Ringworm Cassia, Winged Senna (Photo:22)</td>
<td>Bhil &amp; Garasia</td>
<td>The fresh decoction of leaves taker orally and smear seed-powder paste on the effected body parts.</td>
<td>Pali &amp; Sirohi</td>
</tr>
</tbody>
</table>
| 23 | **Solanum nigrum** L. *Solanaceae*  
Annual herbs, with white flowers and globose red fruits. | **Mako, Kach-Mach, Chirpoti** | **Bhil & Garasia** | The plant sap with fruit made into a paste used externally. | **Pali & Udaipur** | Very effective in plaque Psoriasis. |
| 24 | **Thespesia populnea** (L.) Soland. & Corr. *Malvaceae*  
Tree, with cordate-acuminate leaves, flowers yellow and capsules brown. | **Paras Pipal, Portia Tree, Bendy Tree, Indian tulip tree, Umbrella tree** | **All tribes** | The fresh paste of bark, leaves and roots apply externally and decoction of fruits and roots taken orally. The stem bark with coconut oil boiled is applied externally. | **North-West & East Rajasthan** | Very effective in all type of Psoriasis. The stem bark extract contains carbohydrates, glycosides, tannins, flavonoids, triterpenoids, phytosterols, proteins and lipids/fixed oil in the bark and bark in the form of cream act as anti-psoriatic (11). |
| 25 | **Urginea indica** (Roxb.) Kunth *Liliaceae*  
Scapigerous herbs with white bulbs, flowers pale brown and fruits 3-gonous. | **Safed kando, Jungli Pyaj, Koli Kando, Indian Suqill** | **Bhil, Gurjar & Saharia** | Paste of fresh leaves and white bulbs apply externally on the effected parts. | **Dungarpur, Jhalawar, Kota, Pali & Udaipur** | Effective in plaque and guttate type of Psoriasis. Chinese Herbal Medicine (CHM) has been used for treating Psoriasis and has no side effects (5). |
| 26 | **Wrightia tinctoria** R. Br. *Apocynaceae*  
Deciduous trees or large shrubs, with white flowers in dichotomous cymes. | **Khirni, Dudhi, Karu, Sweet Indrajao Ivory wood (Photo:26)** | **Bhil, Meena & Gurjar** | Dry leaf powder along with water apply externally, sometimes leaves decoction taken orally. | **Dungarpur, Jhalawar, Kota, Pali & Udaipur** | Very effective in Psoriasis. The Hydro-ethanol extract of dry leaves powder trials. Very effective on mouse tail (3). |
1. *Adiantum incisum* Forssk.

3. *Aloe vera* (L.) Burm.f.

4. *Annona squamosa* L.

5. *Argemone mexicana* L.


9. *Capsicum annuum* L.

10. *Cassis auriculata* L.
11. *Cassia occidentalis* L.


15. *Momordica charantia* L.

16. *Nerium oleander* L.

19. *Pongamia pinnata* (L.) Pierre


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. Due to rapid urbanization, destruction of forests by cutting, forest-fire, environmental factors, many precious medicinal plants becoming rare and their information have been lost. For the happiness of humankind, we should have less pollution and more ecological balances, The Government both central and state level should immediately take action to preserve the knowledge of medicinal plants species and herbal remedies, which humankind has received from their ancestor from the past generations, for posterity. To overcome the side effects observed with chemical agents more research and phytochemical analysis is expected for the discovery and development of herbal ayurvedic, homeopathic, unani and allopathic preparation.

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REFERENCES


