

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

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Article Received on
27 Dec 2015,

Revised on 19 Jan 2016,
Accepted on 09 Feb 2016

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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 Infections).

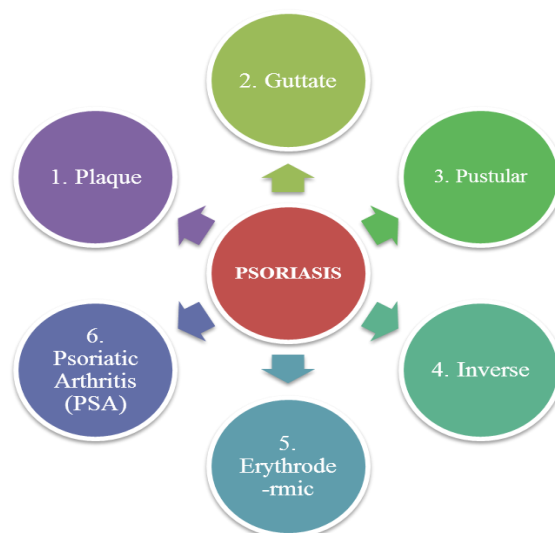


Fig.1: Types of Psoriasis disease

- 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 breast 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*).

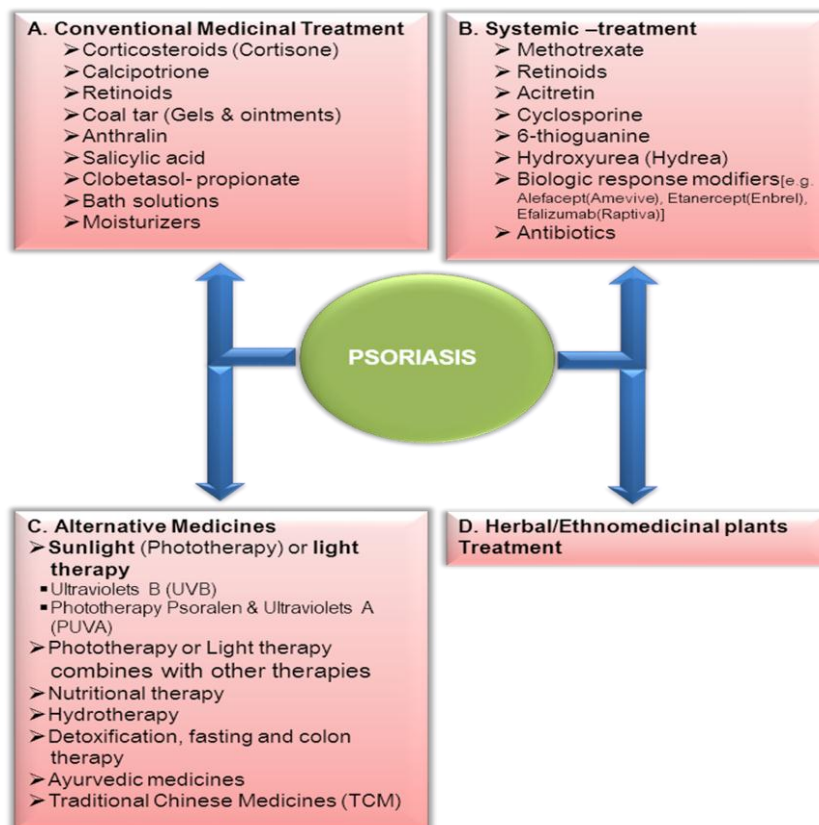


Fig. 2: Showing use of different methods of treatment of Psoriasis diseases.

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 rely plants for their primary healthcare systems to treat various ailments.^[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 a 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 is an increasing research effort to develop herbal formulations 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 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 ones 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 dealt 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 internet 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 annuum* L., *Cassia 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., *Protasparagus 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^o 03` and 30^o 12` N latitude and 69^o 30` and 78^o 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. and 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 collect 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

S.No.	Botanical name, family name & Plant characters	Local name, English name & Plant photos	Tribes name	Plant parts used & mode of use	Districts/ Area	Remarks
1	<i>Adiantum incisum</i> Forssk. <i>Adiantaceae</i> Fronds pinnately compound, sori found along the veins.	Hansraj, Sanjeevini-Buti (Photo:1)	Bhil & Gurjar	The fresh juice of the leaves apply externally.	Kota, Mt. Abu, Pali & Udaipur	Very effective in Pustular and inverse Psoriasis.
2	<i>Adiantum lannulatum</i> Burm. <i>Adiantaceae</i> Fronds pinnately compound, sori found along the veins.	Hansraj, <i>Walking Maiden hair fern</i>	Bhil, Damor & Gurjar	The fresh juice of the leaves apply externally.	Kota, Mt. Abu, Pali & Udaipur	Very effective in Pustular and inverse types of Psoriasis.
3	<i>Aloe vera</i> (L.) Burm.f. <i>Liliaceae</i> Scapigerous, acculescent, succulent, Perennials with dull red yellow tinge flowers.	Gheeganwar, Ganwarpat ha, <i>Barbados Aloe, True Aloe, Kumarpud</i> (Photo:3)	Bhil & Garasia	Leaves sap or juice taken orally and rub on the effected parts of body as gel.	Western Rajasthan, Banswara, Pali & Udaipur	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.
4	<i>Annona squamosa</i> L. <i>Annonaceae</i> Evergreen shrubs or small trees, with yellowish-green flowers and globose or cordate-ovoid green edible fruits,	Sitaphal, Sariffa, <i>Sugar Apple</i> (Photo:4)	Bhils & Kathodi.	Unripe fruits made in to paste applied externally.	Banswara, Chittorgarh Dungarpur Pali & Udaipur	Very effective in inverse Psoriasis and Psoriatic Arthritis (PSA).
5	<i>Argemone mexicana</i> L. <i>Papaveraceae</i> Prickly, annuals, flowers bright yellow, fruits prickly with blackish-brown seeds.	Pilawala dhatura, Pili Katia, <i>Mexican poppy, Mexican prickly Poppy, Flowering thistle</i> (Photo:5)	Bhil, Meena & Gurjar	Fresh plant sap and paste of root powder applied externally.	Bundi, Jhalawar, Kota, Pali & Udaipur	Very effective in plaque and guttate Psoriasis.
6	<i>Aristolochia bracteolata</i> Lam. <i>Aristolochiaceae</i> Annual, herbs, with purple flowers and oblong-ellipsoid green	Hukka bel, Kirramar, Kalipaad, <i>Indian birthwort</i> (Photo:6)	Bhil, Saharia, Garasia & Gurjar	The fresh leaf juice with vegetable oil apply externally.	Bundi, Bara, Dungarpur, Kota, Mt. Abu, Pali &	Very effective in all type of Psoriasis.

	capsules.				Udaipur	
7	<i>Azadirachta indica</i> A. Juss. Meliaceae Tall, evergreen trees, with compound leaves, flowers white or pale yellow and 1-seeded, yellow fruits.	<i>Neem</i> , 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	<i>Cannabis sativus</i> L. Cannabinaceae Annual, pubescent, aromatic herb, with compound leaves, flowers creamish-white and fruits compressed, straw.	<i>Bhang, Charas, Ganja, Soft Hemp, True Hemp</i>	Bhil, Meena, Garasia, Damar, Kathodi, & Gurjar	The paste of dry leaves, plant sap & fruit powder smear over the body also smoked (dry leaves) and Bhang, Charas (resin) 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	<i>Capsicum annum</i> L. Solanaceae Annual or biennial herbs, with dull white flowers and multi-coloured, pungent & many seeded berries.	<i>Mirch, Mirchi, Purple, red, yellow green Chilli and Chilli</i> (Photo:9)	All tribe	Paste of dry leaves applied externally	Western Rajasthan	Effective in plaque Psoriasis.
10	<i>Cassia auriculata</i> L. Caesalpinaceae Bushy shrub, with compound leaves bright flowers and brown pods.	<i>Anwal, Tarwan, Tanners Cassia, Avaram</i> (Photo:10)	Garasia & Saharia	Root powder paste with vegetable oil smear over the effected parts.	Chittorgarh, Kota, Pali, Sirohi & Udaipur	Effective in PSA & Guttate type of Psoriasis.
11	<i>Cassia occidentalis</i> L. Caesalpinaceae Diffuse undershrub, with 3-6 pairs of leaflets and yellow flowers.	<i>Kesundo, Mari-pumbadio, Coffee senna</i> (Photo:11)	Bhil & Garasia	Paste of leaves apply externally	Banswara, Pali & Udaipur	Effective in all type of Psoriasis.

12	<i>Cassia tora</i> L. <i>Caesalpinaceae</i> Undershrub, with yellow flowers and linear pods.	<i>Puaria, Talka chak-undra, Foetid cassia, The Sickle senna, Wild senna</i>	Garasia	The fresh decoction of leaves & seeds taken orally and paste apply externally	Pali & Sirohi	Effective in all type of Psoriasis. The cream made by methanolic extract of leaves applied externally act as anti-psoriatic (6).
13	<i>Holoptelea integrifolia</i> (Roxb.) Planch, <i>Ulmaceae</i> Deciduous tree, with yellowish flowers and winged fruits.	<i>Papri, Kanjeri, Churil, Indian Elm, Entire leaved elm tree (Photo:13)</i>	Bhil & Garasia	The paste of fresh tender leaves applied externally.	Pali, Sawai Madhopur & Udaipur	Effective in all type of Psoriasis. The cream made by methanolic extract of leaves applied externally act as anti-psoriatic (9).
14	<i>Leptadenia pyrotechnica</i> (Forssk.) Decne. <i>Asclepiadaceae</i> Erect, bushy shrubs, with greenish-yellow flowers & ovate seeds.	<i>Kheemp, Thaliawar, Khip (Photo:14)</i>	Garasia & local people	Yellow plant sap apply externally.	Western Rajasthan desert .	Very effective in plaque and guttate Psoriasis.
15	<i>Momordica charantia</i> L. <i>Cucurbitaceae</i> monoecious climbers, with yellow flowers & muricate fruits.	<i>Karela, Karelo, Bitter gourd, Carilla fruit (Photo:15)</i>	Bhil & Kathodi	Fresh leaves and fruits decoction taken orally.	Southern Rajasthan	Very effective in plaque and guttate Psoriasis.
16	<i>Nerium oleander</i> L. <i>Apocynaceae</i> Evergreen shrubs, with showy white and reddish-pink flowers in cymes.	<i>Kaner, Kaneer, Chandani, Oleander, Rose-Bay (Photo:16)</i>	Bhil, Saharia & Gurjar	The paste of stem, roots and flowers smear externally.	Banswara, Jhalawar, Kota, Mt. Abu, Pali & Udaipur	Very effective in Plaque, Pustular and inverse types of Psoriasis.
17	<i>Ocimum canum</i> Sims. <i>Lamiaceae</i> Perennial aromatic undershrubs, flowers white and seeds ovoid.	<i>Tulsi, Bapchi, Van-Tulsi</i>	All tribal people of the state	Fresh leaf-paste apply, externally in parasitical skin diseases.	Throughout the State	Very effective in Pustular and inverse types of Psoriasis.
18	<i>Oxalis corniculata</i> L. <i>Oxalidaceae</i> Annual, creeping herbs, with 3-foliolate leaves, yellow flowers and	<i>Khatri-buti, Khataria, Khati</i>	Bhil, Meena, Damor, Saharia &	The fresh plant sap apply externally.	Banswara, Bundi, Jhalawar, Kota, Pali &	Very effective in plaque Psoriasis.

	oblong capsules.		Gurjar		Udaipur	
19	<i>Pongamia pinnata</i> (L.) Pierre Fabaceae Spreading evergreen trees, with compound leaves, flowers pinkish-white or pinkish-purple and obliquely-ovoid, wood, brown fruits.	<i>Karanj, Kanja, Papra Pongam oil Tree, Indian Beech.</i> (Photo:19)	Kathodi & Garasia	Seed oil apply externally.	Pali & Udaipur	The seed-oil contains flavonoids, used in the preparation of ointments. The ethanolic extract of seeds is very effective in all types of Psoriasis (2).
20	<i>Psoralea corylifolia</i> L. Fabaceae Annual herb with simple suborbicular leaves, flowers bluish-purple and fruits 1-seeded.	<i>Bakhni, Bavechi</i>	Bhil, Gurjar & Garasia	Fresh leaves and fruits decoction taken orally & fruits paste smear externally.	Banswara, Jhalawar, Kota, Pali & Udaipur	Cure psoriasis and other skin diseases like leucoderma, eczema etc. The plants contains phenols, coumarins-psoralen and flavonoids, used in ointments (2).
21	<i>Protaspargus racemosus</i> (Willd.) Oberm. (<i>Asparagus racemosus</i> Willd.) Liliaceae Spiny, branched, climbers with linear-falcate cladodes, flowers white, fragrant and fruits globose, red. The white tuberous roots are edible.	<i>Sat Mooli, Satawari, Satawari, Safed musali, Vankanto</i> (Photo:21)	Kathodi, Bhils & Garasia	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.	South & Western Rajasthan	Very effective in all type of Psoriasis.
22	<i>Senna alata</i> (L.) Roxb. (<i>Cassia alata</i> L.) Caesalpiniaceae Shrub, flowers yellow and fruits, longitudinally winged.	<i>Dasmardan, Senamukhi, Candlestick Senna, Ringworm Cassia, Candle bush, Ringworm Cassia, Winged Senna</i>	Bhil & Garasia	The fresh decoction of leaves taker orally and smear seed-powder paste on the effected body parts.	Pali & Sirohi	Very effective in all types of Psoriasis and seed oil used in soap making (10).

23	<i>Solanum nigrum</i> L. <i>Solanaceae</i> Annual herbs, with white flowers and globose red fruits.	<i>Mako, Kach-Mach, Chirpoti</i>	Bhil & Garasia	The plant sap with fruit made into a paste used externally.	Pali & Udaipur	Very effective in plaque Psoriasis.
24	<i>Thespesia populnea</i> (L.) Soland. & Corr. <i>Malvaceae</i> Tree, with cordate-acuminate leaves, flowers yellow and capsules brown.	<i>Paras Pipal, Portia Tree, Bendi Tree, Indian tulip tree, Umbrella tree</i>	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	<i>Urginea indica</i> (Roxb.) Kunth <i>Liliaceae</i> Scapigerous herbs with white bulbs, flowers pale brown and fruits 3-gonous.	<i>Safed kando, Jungli Pyaj, Koli Kando, Indian Suqill</i>	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	<i>Wrightia tinctoria</i> R. Br. <i>Apocynaceae</i> Deciduous trees or large shrubs, with white flowers in dichotomous cymes.	<i>Khirmi, Dudhi, Karu, Sweet Indrajao Ivory wood (Photo:26)</i>	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.



6. *Aristolochia bracteolata* Lam.



7. *Azadirachta indica* A. Juss.



9. *Capsicum annuum* L.



10. *Cassia auriculata* L.



11. *Cassia occidentalis* L.



13. *Holoptelea integrifolia*
(Roxb.) Planch



14. *Leptadenia pyrotechnica*
(Forssk.) Decne.



15. *Momordica charantia* L.



16. *Nerium oleander* L.



19. *Pongamia pinnata* (L.) Pierre



21. *Protoasparagus racemosus*
(Willd.) Oberm.



26. *Wrightia tinctoria* R. Br

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.

ACKNOWLEDGEMENTS

The authors are thankful to Dr. Atul Vijay, M.D. Skin & V.D. Associate Professor for ceaseless encouragement and facilities providing during the course of present study. We are also thankful to all teaching staff of Biochemistry Department of this medical college for suggestions and encouragement during the study. Thanks are also extended to Dr. R.P. Pandey, Ex Scientist 'D' & Head of office, BSI, AZRC, Jodhpur for their support during conducting the study and identifying the plant specimens.

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