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Therapeutic Effect of *Khadira* (*Acacia catechu*) in *Ekakustha* Vis-À-Vis (Psoriasis)



Apala Sengupta¹, Rupashri Nath^{2*}

1. Reader, Department of Roga nidana and vikriti vinyana, Institute of Post Graduate Ayurvedic Education and Research at S.V.S.P., Kolkata.
2. Ph.D scholar, PG department of Roga nidana and vikriti vinyana, National Institute of Ayurveda, Jaipur.

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ABSTRACT

Khadira [*Acacia catechu* (L.f.) Willd] is considered as the best remedy for the treatment of skin disorders in Ayurveda system of medicine. The gummy extract of *Acacia catechu* is applied to the patient of *Ekakustha* (psoriasis) orally since ancient time. The present study aimed to clinically evaluate the therapeutic effect of *khadira* in *Ekakustha* (Psoriasis). 40 Patients suffering from Psoriatic skin disorders were selected strictly based on inclusion and exclusion criteria of the study. A dry powder of black catechu 3 gms twice daily was administered to the selected patients. PASI (Psoriasis Area Severity Index) was applied in before and after treatment to assess the treatment effect. The measurement was done based on three major clinical criteria, i.e., erythema, induration, and desquamation. Obtained effects in terms of numerical measurement of PASI were evaluated statistically. Results showed highly significant ($P < 0.001$) effect of *Khadira* in *Ekakustha* vis-à-vis Psoriasis.



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INTRODUCTION

In the classical text, *Kustha* is specified as an obstinate skin disorder. This disease affects the cosmetic values of an individual. ^[1] In the pre-historic era when the human beings are realizing the diseases and extending their remedies, they tried hard to find out the medicaments of *Kustha* considering its disgraceful entity. Eighteen clinical varieties of *Kustha* has described in classical *Ayurveda* text, which includes *Ekakustha*. Clinical and morphological features of *Ekakustha* are correlated with psoriasis by many scholars. Etiologies and pathogenesis of *Kustha* and *Ekakustha* have described elaborately in the classical text. Specific pathogenic factors are determined on the basis of specific nature of manifestation of a disease. ^[2] This theory is utilized during the determination of the specific line of treatment. Definite etiopathogenesis of psoriasis is remaining obscured till today. ^[3] Psoriasis is referred as T-cell mediated disease as persistent T-lymphocyte activation resulting from autoreactivity accelerated epidermal turnover resulting skin lesions. Utilizing this theory, instead of immuno-suppression, immunomodulation was done to develop co-stimulatory pathways to prevent skin damages. *Ekakustha* is a *vata-kapha* predominant *tridoshaja vikara*, clinically identified by *asvedana mahavastu*, *matsasakalaupama* (loss of sweating and fishery scale). ^[4] Its clinical diagnosis is done by the assessment of specific *vedana* (pain), *varna* (color), *akriti* (texture), *prabhava* (special feature), *purvarupa* (pro-dermal symptoms) and *upadrava* (complications). ^[5]

Classically *Khadira* [*Acacia catechu* (L.f.) Willd] is considered as the best drug of *kustha*. ^[6] Therapeutically *Khadira* is also used in *prameha* and *shvitra*. ^[7] Immunomodulatory role of *Khadira* is also reported. ^[8] Commercially it is known as black catechu or *kattha*, i.e. extract of heartwood of *Acacia catechu*. In the present study aimed to clinically evaluate the therapeutic effect of *khadira* in *Ekakustha* (Psoriasis).

MATERIALS AND METHODS

40 Patients suffering from Psoriatic skin disorders were selected from OPD and IPD of Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra pith irrespective of their sex, religion, and occupation.

PASI (Psoriasis Area Severity Index) was applied to diagnose the disease and to measure the degree of severity of the disease before treatment. Patients were included in the study following

strictly based on inclusion and exclusion criteria. A dry powder of black catechu was administered to the selected patients. PASI was measured periodically after treatment.

Selection Criteria: Erythema, Indurations, and Desquamation (EID) of various extents were identified with a positive Auspitz's and Candle grease sign. EID was measured by PASI (a continued index of Psoriasis Area Severity Index).

Inclusion Criteria: Patients satisfying more than >10.00 score of PASI and the age group of 10 to 70 years was included in this study. Only 'Plaque' type of Psoriasis was selected. Patients suffering from mild Psoriatic Arthritis were also included.

Exclusion Criteria: The patients below 10 years and above 70 years, gutted and pustule type of Psoriasis; patients with severe psoriatic arthritis; pregnant patients; patients suffering from other systemic disease and systemic failure like diabetes mellitus, renal failure, hepatic failure, etc.; and patients of below 10.00 of PASI score were excluded from this study.

Criteria for Assessment by PASI: PASI was the objective tool for the clinical evaluation of Psoriasis and also for monitoring the response of therapeutic regimen. The equation presented as follows:

$$\text{PASI score} = 0.1 (E_h + I_h + D_h) \times A_h + 0.2 (E_u + I_u + D_u) \times A_u + 0.3 (E_t + I_t + D_t) \times A_t + 0.4 (E_l + I_l + D_l) \times A_l$$

Degree of extent evaluated as 0 = nil, 1 = mild, 2 = moderate, 3 = severe, 4 = very severe (Table 1).

Drug Dosage: Dry powder of *Khadira* [*Acacia catechu* (L.f.) Willd] were administered orally to the selected patients at 3 gms twice daily at 6 AM. and 6 PM.

Duration of Study: Drug therapy was administered for one year. Drug therapy was stopped following the remission at a recognizable rate of PASI after 1 year.

Follow Up: Follow-up treatment was done for another one year. Four seasons were covered to assess seasonal variations. Follow up visit was planned every month. At each visit subjective criteria of eruptions, scaling, itching and objective criteria of PASI were observed. As Psoriasis

is a disease of exacerbation and remission through long term, hence the rate of relapse was observed in terms of PASI during follow-up.

Statistical Methods: The scores of PASI, before treatment and after treatment were expressed in percentages within a range of 72.0 to 0.0 where 72.0 was taken as 100% and 0.0 was taken as 0.0%. The difference between before and after treatment is legitimately accepted as recovery.

Thirty-six patients having psoriasis of varying degree were volunteers for treatment. Measurement of PASI scores was done initially. Again, after treatment, PASI was measured at an interval of six months and one year. All the values were expressed as mean, SD (Standard Deviation), SEM (Standard Error of Mean) and 't' value. The data were analyzed by paired 't' test. A level of $P < 0.05$ and $P < 0.001$ was considered as statistically significant and highly significant respectively. The level of significance was noted and interpreted accordingly.

RESULTS AND OBSERVATION

Total 40 patients were registered, among them 36 patients have completed the treatment schedule and 4 patients were left against the medical advice. Critical value has been found 2.58. This critical difference is as lower than the mean difference between before treatment and 6 months after treatment and as well as one year after treatment. Differences between treatments were quite larger than critical differences.

The result of the study showed that treatment of *Khadira* brought remission of Psoriasis significantly ($P < 0.001$) within six months further following some treatment. PASI was reducing gradually at an enhanced rate after one year. The remissions were nearly less than 50% after six months of treatment. After 1 year of treatment of PASI was found at 0.0%, signifies complete cure (Table 2, Figure-4-10).

In the treatment sample, none of the patients showed evidence of relapse of a rate of (5.1% - 10.0%) score of PASI. In 88.80% (32) of cases, relapse was at a very low rate as it remains limited within (0.0%-0.1%) of PASI score. Only 11.20% (4) of patients were showing relapse within (0.1%-5.0%) of PASI score (Table 3).

DISCUSSION

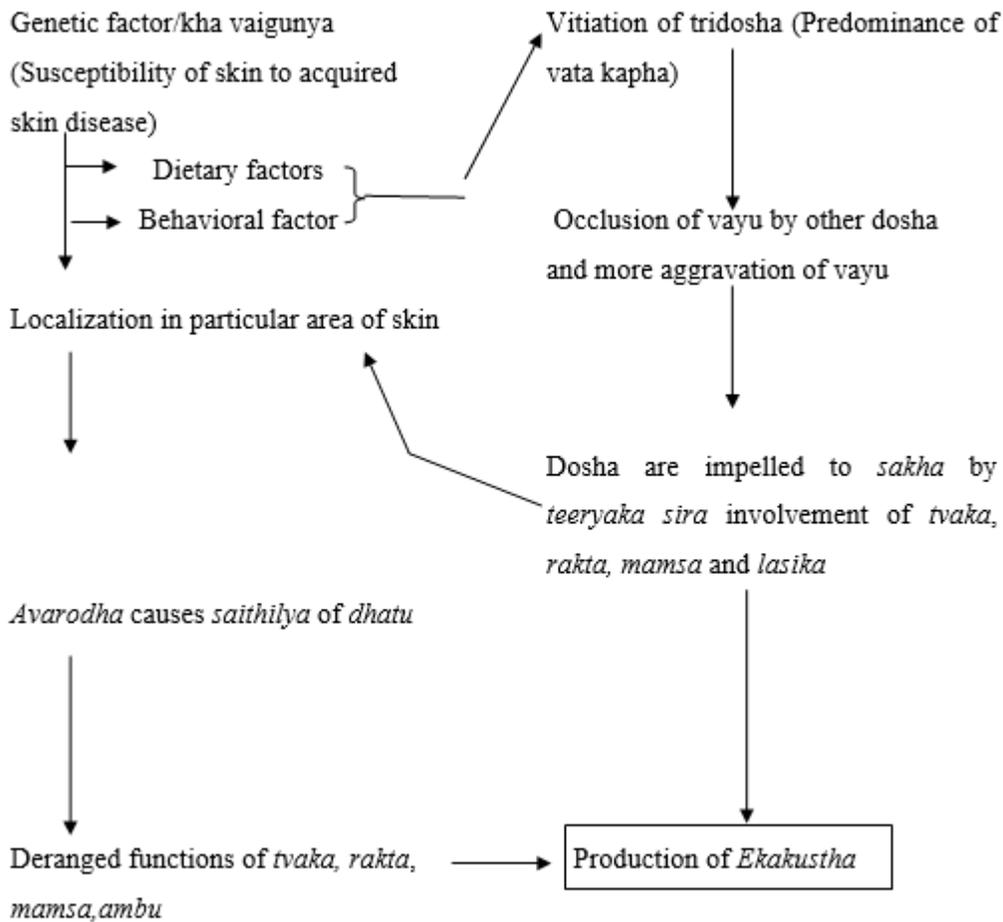
All the patients were exhibiting the clinical criteria of *Asvedana*, *Mahāvāstu* and *Matsāsakalaupama*, had satisfied the objective criteria of erythema, indurations, and desquamation along with other confirmatory features of psoriasis. Hence, 100 percent of the patient selected were suffering from *Ekakustha* (psoriasis). On analysis of treatment effect, result demonstrated that oral administration of *Khadira* showed significant recovery from *Ekakustha* (psoriasis).

Khadira contains *tikta-kashaya rasa* (bitter and astringent taste).^[9] These two *rasa* by the virtue of their pharmacological properties like *Soshana* (absorption), *Vishaghnatva* (anti poisonous), *Kandu prashamana* (reduce itching sensation), *Tvakmamsa*, *sthirikarana* (nourishment and strengthening of skin and muscle) and *pidana*, *ropana* (wound healing), *Kledaupashosana* (dry of exudation)^[10] causes therapeutic action of reducing edema, detoxification, restoration, antihistaminic action and contraction, healing, clearing of derbies. All these pharmacological properties as a whole are able to exert an anti-inflammatory action on the affected areas of skin, which is beneficial to cure psoriasis, especially during active lymphocyte infiltration. The principal pharmacological action of *Khadira* is *Kusthaghna* (destroy any kind of skin ailments). The essential mechanism in origin of *Kustha* is ‘*Saptadravyasangraha*’, i.e., accumulation and vitiation of *Tridoshaja* and four *dhatu*s to create the disease.^[11] Clarification of the term ‘*ghna*’ is destroying, killing.^[12] *Khadira* completely inhibits the pathway of pathogenesis of *Kustha* by creating an unfavorable condition in *dosha dushya sammurchana* (destroy the causative pathological factors). *Khadira* is most potent drug to cure all types of *Kustha* including *Ekakustha*. *Ekakustha* is a *vata kapha* predominant skin disorder. *Vata kapha* clinically expresses the major features of *Asvedana*, *mahāvastu*, *matsāsakalaupama* including some other features like *Ruksha*, *Kharabhava* (roughness), *shaitya* (coldness), *utseda* (elevation), *Parushya*, *Gaurava* (heaviness) etc. However, the heartwood of *Khadira* is *shita virya* (cold potency) but *Khadira sara* (catechu) is *ushna* (hot potency).^[9] *Agneya gura* (hot and heavy) pacifies aggravated *Kapha* and *Vata* irrespectively to their *pancabhautika* constituents, as *Kapha* present (*Kapha* = *Kshiti* + *Apa*) and *Vata* (*Vata* = *Vayu* + *Akasha*).

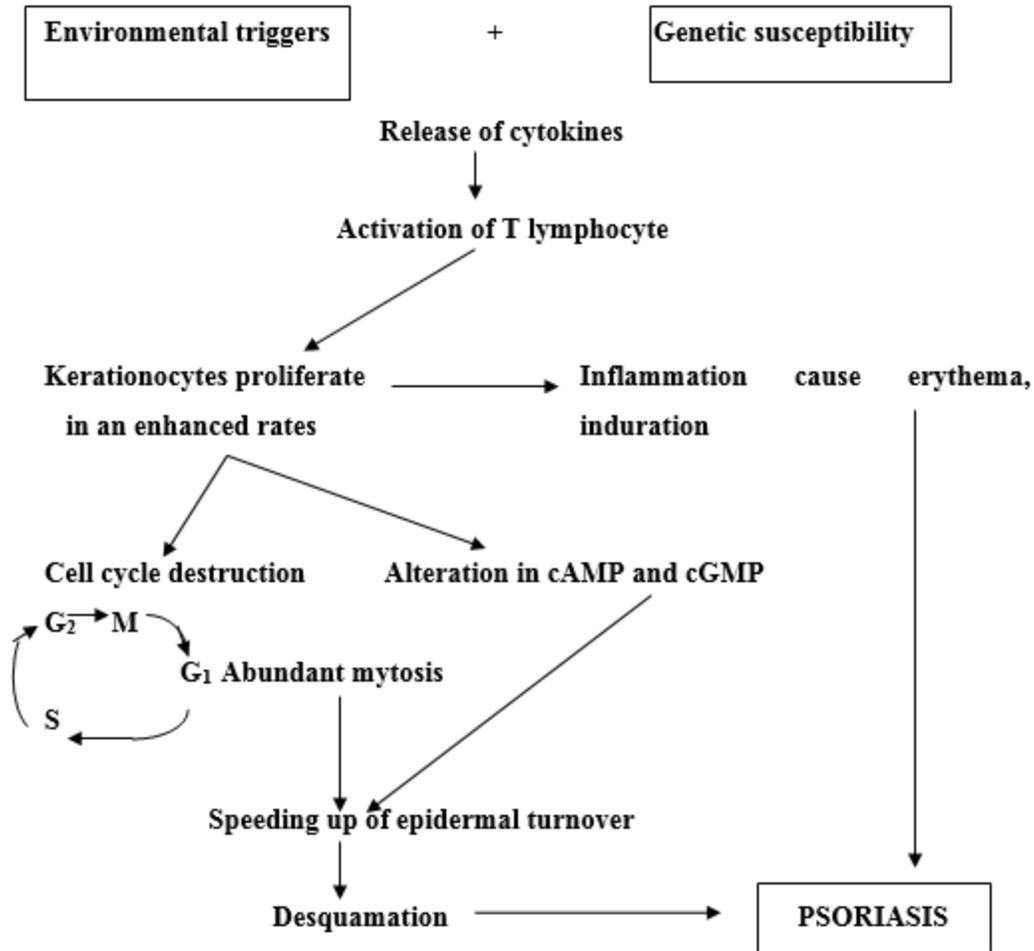
Khadira contains epicatechin, fiscetin, quercetin, and other important tannins. Catechu is reported to regulate cytotoxic T-cells.^[15] Fiscetin is a hepatoprotective compound as it is reported

to be effective in icteric viral hepatitis.^[16] Quercetin inhibits histamine release and tannin acts as the vasoconstrictor. Hence the mentioned pharmacological actions are collectively potent to counteract the inflammatory autoimmune reactions as occurs in Psoriasis. This information is needed to be explored further in more detail.

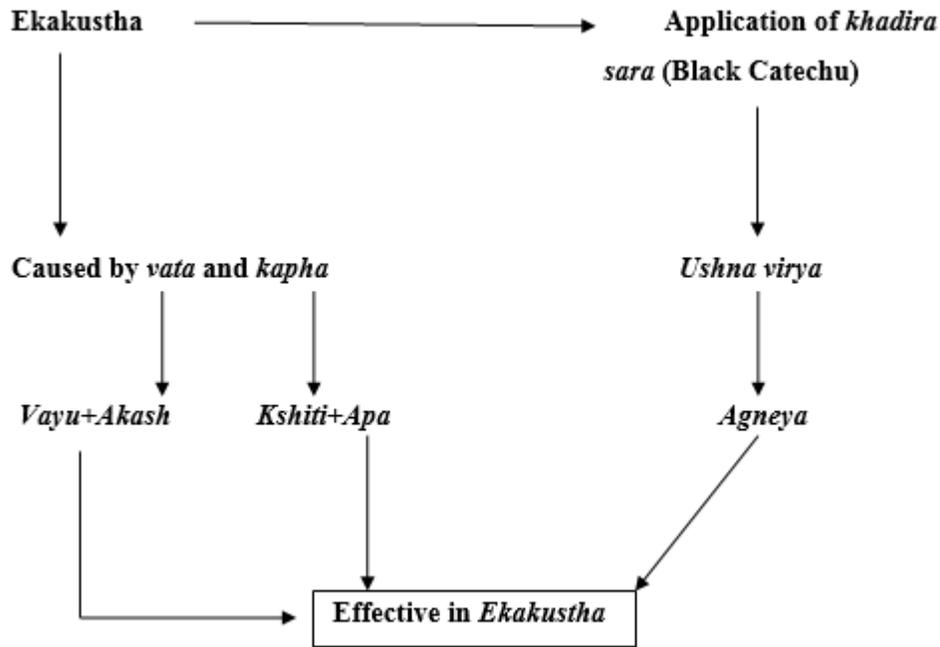
SCHEMATIC EXPLANATION OF PATHOGENESIS (SAMPRAPTI) OF EKAKUSTHA:



SCHEMATIC PRESENTATION OF PSORIASIS:



MODE OF ACTION OF KHADIRA [*Acacia catechu* (L.f.) Wild] IN EKAKUSTHA:



CONCLUSION

In the present study, the curative value of *Khadira* [*Acacia catechu* (L.f.) Wild] in Psoriasis was evaluated and illustrated. In the view of results and discussion, it reveals that oral administration of *Khadira* is a good remedy for *Ekakustha* (Psoriasis). Further study can be taken to explore the probable mode of action of this drug.

Table 1: PASI (Psoriasis Area Severity Index) Score

Code	h	u	t	l	E	I	D
Body region	Head	Upper extremities	Trunk	Lower extremities			
Clinical significance					Erythema	Induration	Desquamation
Degree of Extent					0-4	0-4	0-4

Graduation of four body area is done as : 1 < 10%, 2 = (10 to 29)%, 3 = (30 to 49)%, 4 = (50 to 69)%, 5 = (70 to 89)%, 6 = 90% or more. The score varies in between 0.0 to 72.0

Table 2: Effect of test drug on PASI score after 6 months and 1 year of treatment

PASI Score	Mean	SD	SEM	't'
Before treatment	19.64	5.39	0.90	
After 6 months of treatment	5.78	3.37	0.56	19.80**
After 1 year of treatment	2.28	2.34	0.39	22.55%

n=36; ** = Highly significant (P<0.001) by Student's 't' test.

Table 3: Showing the incidence of relapse during follow-up in 36 patients

Relapse in % of PASI	No. of Patients	Percentage (%)
0.0-0.1	32	88.80
0.1-5.0	4	11.20
5.1-10.0	Nil	00

HISTOPATHOLOGICAL FINDINGS IN PSORIASIS:

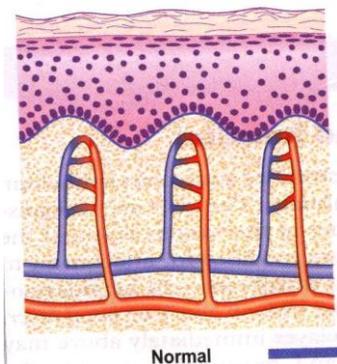


Figure-1 normal skin

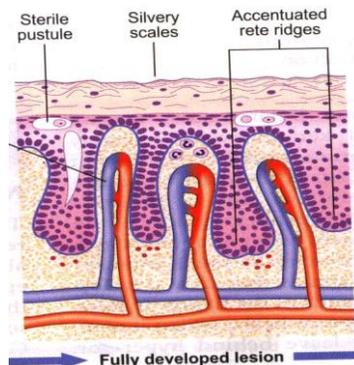


Figure-2

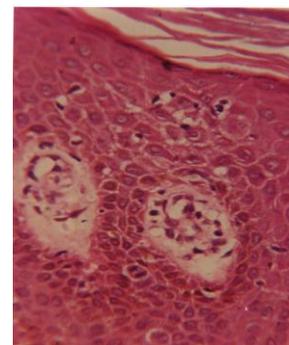


Figure-3

Figure-2, 3 showing a magnified Histopathological section of Psoriasis where parakeratosis, elongation of papillae and lymphocyte infiltration are demonstrated.

PATIENT OF PSORIASIS BEFORE AND AFTER THERAPY:



Figure-4, patient of psoriasis

Before treatment



Figure-5, patient of psoriasis

Before treatment



Figure-6, patient of psoriasis

Before treatment



Figure-6, patient of psoriasis

After treatment



Figure-7, patient of psoriasis

Before treatment



Figure-8, patient of psoriasis

Before treatment



Figure-9, patient of psoriasis

Before treatment



Figure-10, patient of psoriasis

after treatment

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