

A COMPARATIVE PHARMACOTHERAPEUTIC STUDY OF KHADIR AND NEEM ON DADRU

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ABSTRACT

Dravyaguna is the backbone of Ayurvedic treatment. It studies the medicinal value of all the Dravyas. From the beginning, drugs obtained from plants are the main source to care the diseases and restore quality of life. *Khadira* is described under the group of *Kushthaghna*, *Udardaprashamana*, *Kashaya skandha gana* by Charaka, and *Sal-saradi gana* by Sushruta. The plant contains *tannin*, *catechin*, *epicatechin*, *kaemferol alkaloids*, *flavonoids*, and *toxifolin*. In Ayurvedic texts, *Khadira* is considered a *Kushthaghna* and a single-used drug for all types of skin disorders thoroughly in both internal and external modes. In Charaka Samhita, *Neem* is classified as *Kandughna Mahakashaya* and also in the group of bitters i.e., *Tiktakandha*. Sushruta has included *Nimba* under the group of *Aragvadhadi Gana* especially for ‘*Kusthaghna*, *Kandughna*’ and *Vrana Shodhana*, *Guduchyadi Gana*, ‘*Lakshadi Gana*’ especially for *Kusthaghna* and *Krimighna*. All the skin diseases in Ayurveda have been discussed under the broad heading of “*Kushtha*”, which is further divided into *Mahakushtha* & *Kshudrakushtha*. *Dadru* is considered one of the *kshudra kushtha*. Acharya Charak mentioned *Dadru* in *Kshudrakushtha*, whereas Sushruta in *Mahakushtha*. Clinical study of any drug provides strong evidence regarding the action of a drug on a particular disease or system. Thus, this study has its own importance in medicine to assess the efficacy of the drug. So, both the drugs *Khadira* (*Acacia catechu* Willd.) Bark Churna and *Neem* (*Azadirachta indica* A. Juss.) Bark Churna was decided to use clinically on *Dadru*.

Key words: *Khadira*, *Acacia catechu*, *Neem*, *Azadirachta indica*, *Dadru*, *Kushtha*, *catechin*.

INTRODUCTION

Dravyaguna is the backbone of Ayurvedic treatment. It studies the medicinal value of all the Dravyas. From the beginning, drugs obtained from plants are the main source to care the diseases and restore quality of life. All the skin diseases in Ayurveda have been discussed under the broad heading of "Kustha", which is further divided into Mahakustha & Kshudra Kustha. *Dadru* is considered one of the kshudra Kustha. Acharya Charak mentioned *Dadru* in *Kshudrakustha* ^[1], whereas Sushruta in *Mahakustha* ^[2]. In my hospital (Govt. Ayurvedic College & Hospital, Patna) OPD I use to get a lot of patients daily with complain of raised vascular patches on their skin and itching. Patients also complain about the time taking procedure of treatment which they have gone through and the higher cost of medicines which gives an extra burden on the pocket of patients. These things propelled me to move forward towards the scientific approach and research work about the properties and functionalities of dravyas like **Khadir** and **Neem** and their superlative actions as '*Kusthaghna Dravyas*'. I would like to make treatment feasible and cost-effective. Medicine should be "Easy to prepare and easy to intake". The **Khadir** and **Neem** contain all the above explained properties with easily available in our surroundings. So, I decided to do my research work on the concerned topic- A Comparative Pharmacotherapeutic Study of *Khadir* and *Neem* on '*Dadru*'.

KHADIRA:

Botanical Classification

Botanical Name: *Acacia catechu* Willd.

Family Name: Mimosoideae

Subfamily: Melioideae

Kingdom: Plantae – Plants

Sub kingdom: Tracheobionta – Vascular plants

Spermatophyta: Seed plants

Division: Magnoliophyta - Flowering plants

Class: Magnoliopsida - Dicotyledons

Subclass: Rosidae

Order: Fabales

Family: Fabaceae - Pea family

Genus: *Acacia* Mill. – *Acacia*

Species: *Acacia catechu* Willd. – black cutch

According to Ayurveda ^[3]: -

Synonyms : *Khadira*, *Raktasara*, *Gayatri*, *Dantadhawana*, *Kantaki*, *Balapatra*, *Bahushalya*, *Yajniya*.

Vernacular names: Sanskrit: *Khadira*, *Raktasara*, *Gayatri*, *Dantadhawana*, *Kantaki*, *Balapatra*, *Yajniya*., Hindi: *Khaira*, Kannada: *Kaggali*, English: *Cutch tree*

Ayurvedic Properties:

Rasa - Tikta, Kashaya, **Guna** – Laghu, Ruksha

Veerya - Sheeta, **Vipaka** - Katu

Prabhava - Kushtaghna

Doshaghna – Kapha Pittashamaka properties.

Chemical composition:

The chief constituents of Heartwood are Catechin and catechutannic acid. The wood contains epicatechin, catechin, tetramer, dicatechin, galocatechin, kaempferol, taxifolin, isorhamnetin, (+)-afzelechin, Acid hydrolysis of the gum afforded L-arabinose, D-galactose, D-rhamnose, aldobiuronic acid, etc.

NEEM

Botanical Classification: -

Botanical name: *Azadirachta indica* A. Juss.

Family: Meliaceae

Subfamily: Melioideae

Tribe: Melieae

English name: *Neem tree*

Kingdom: Plantae

Order: Rurales Sapindles

Genus: *Azadirachta* Juss in Mem. Mus Par, XIX (1830) 220(Me168) 1830 *Melia*

Species: *Indica*

According to Ayurveda ^[4]: -

Synonyms: *Nimba*, *Tiktaka*, *Arista*, *Hingu-niryasa*, *Pichumarda*, *Pichumanda*, *Paribhadra*, *Neta*, *Yavanesta* etc.

Vernacular names:

Hindi: *Neem*

English: *Margosa tree* *Neem tree* or *Indian Lilac*

Telugu: *Vepa*, *Yapachettu*

Tamil: *Vempu*, *Veppam*

Malayalam: *Veppu*

Ayurvedic Properties:

Rasa - Tikta, Kashaya, Guna – Laghu, Veerya - Sheeta, Vipaka - Katu

Doshagnata – Kapha Pittashamaka properties.

Chemical composition: -The constitute of different parts of the Neem tree has been studied extensively over the last few decades. Margosic acid, Nimbin, Nimbidin, Nimbinin, Azadirone, Kaempferol, Quercurcetin, Beta-Sitosterol, Vanillic acid, Meliacins, etc. have been isolated from Nimba.

DADRU

The human skin is the outer covering of the body and is the largest organ of the integumentary system. The skin has multiple layers of ectodermal tissue and guards the underlying muscles, bones, ligaments, and internal organs. Majority of the skin diseases are not fatal but create comparatively greater stress and strain on the patient. Skin diseases are more painful & irritant, some of them are contagious. All the skin diseases in Ayurveda have been discussed under the broad heading of “Kushtha”, which is further divided into Mahakushtha & Kshudrakushta. Dadru is considered one of the kshudra kushtha. Acharya Charak mentioned Dadru in Kshudrakushta, whereas Sushruta in Mahakushtha. Dadru is mentioned under Kshudrakushta because of its relapsing nature, mild signs, and symptoms, local infection, and superficial in nature. Spreads slowly if not treated and its treatment is not difficult. As per the classical signs and symptoms of Dadru, it can be equated with Dermatophytosis.

SAMPRAPTI (PATHOGENESIS):

Dadru is involved in seven factors namely three Doshas and four dushyas i.e., Twak, Rakta, Mamsa & Lasika^[5].

According to Charak Samhita (Chi. Ni 5/6), Due to various Nidana Sevana, Tridosha gets vitiated simultaneously & produces *Shaithilya* in the *Twaka*, *Mamsa*, *Rakta*, and *Ambu*. Then *Tridosha* gets seated in *Sithila dhatu* and vitiates them with *Lakshanotpatti* of *Kushtha Roga*^[6].

CLINICAL STUDY

Dermatophytosis is the commonest dermatologic ailment coming under superficial fungal infections of

the skin. Taking a lead from the *Ayurvedic* description of *Kushtha*, Dermatophytosis can be correlated with *Dadru Kushtha*. The various classics of Ayurveda have described the therapeutic role of *Khadira* and *Neem* in many diseases specially in the treatment of *Dadru*. Clinical study of any drug provides strong evidence regarding the action of a drug on a particular disease or system. Thus, this study has its own importance in medicine to assess the efficacy of the drug. So, both the drugs *Khadira* (*Acacia catechu* Willd.) Bark Churna and *Neem* (*Azadirachta indica* A. Juss.) Bark Churna was decided to use clinically on *Dadru* to assess the reducing properties with the following aims and objectives.

AIMS AND OBJECTIVES:

1. To study the etiology, pathogenesis, and symptomatology of *Dadru*.
2. To assess the clinical effect of *Khadira* Bark Churna and *Neem* Bark Churna on *Dadru*.
3. To find out whether the drug possesses any side effects or not.

MATERIALS AND METHODS:

1. Criteria for selection of patients:

For the present study, patients with classical signs and symptoms of *Dadru* who were attending the O.P.D. & I.P.D. of Research unit of Govt. Ayurvedic College and Hospital, Kadamkuan, Patna, were randomly selected for the study. As per the proforma, the detailed history, clinical examination, and investigations were done and recorded. Consent from the patient/guardian prior to inclusion into the study has been taken.

2. **Preparation of Drug:** Fine powder of *Khadira* stem bark and *Neem* stem bark.

3. Criteria for exclusion:

- a. Patients of age less than 15 years and more than 70 years.
- b. Irregular and complicated patients having H/o diabetes, asthma, etc.
- c. Patients on corticosteroid therapy.

4. Criteria for diagnosis:

- a. For the diagnostic purpose, the classical signs and symptoms described in different samhitas have been taken up.

b. A detailed proforma incorporating all the classical signs and symptoms of the disease has been prepared.

5. **Duration of treatment:** The duration of treatment was 90 days, with every 15 days follow-up. The record of the patients was maintained for three months.

Assessment of the total effect of therapy: The observations of signs and symptoms and other clinical parameters were recorded before and after the treatment. The data obtained were analyzed statistically and the assessment of therapy was.

7. **Follow-up:** The patients were followed up every 15 days for 3 months.

MANAGEMENT OF THE PATIENTS:

All the patients selected for the clinical trial have been studied into **three** groups.

Group A: Patients were treated with Khadira Stem Bark Churna.

Number of patients: – In this group, 20 patients were selected.

Duration: - 03 months, **Dose:** - 3 grams Twice daily.

Group B: Patients were treated with Neem Stem Bark Churna.

Number of patients: – In this group, 20 patients were selected.

Duration: - 03 months, **Dose:** - 3 grams twice daily.

Group C: Patients were treated with Khadira Stem Bark Churna and Neem Stem Bark Churna.

Number of patients: – In this group, 20 patients were selected.

Duration: - 03 months, **Dose:** - 3gm. (1.5gm.+ 1.5gm.) twice daily.

OBSERVATIONS & RESULTS

PRESENTATION OF DATA:

The data collected and compiled from this clinical trial are sorted out and processed further by implying various statistical methods and presented in tabular form in the following sequence.

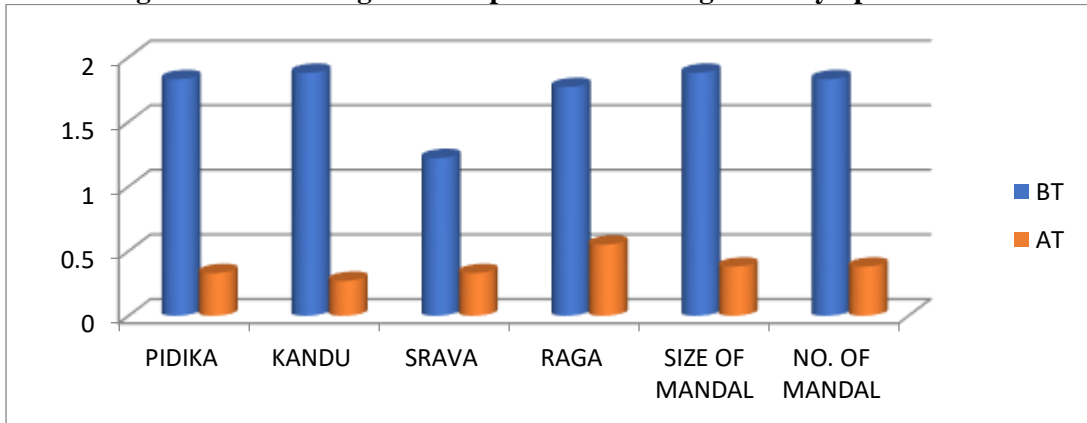
- General observations viz. age, sex, religion, etc.
- Nidanatmaka and Lakshanatmaka parikshana.
- The results of therapy were evaluated on the basis of improvement in subjective and objective parameters of various rating scales.

OBSERVATIONS:

A total of 60 patients of Dadru were registered in the present study. Out of which 6 patients discontinued the treatment before completion of the course against the medical advice. Hence, the total number of patients is 54 for the present study. The observations made during the course of the study were presented as follows:

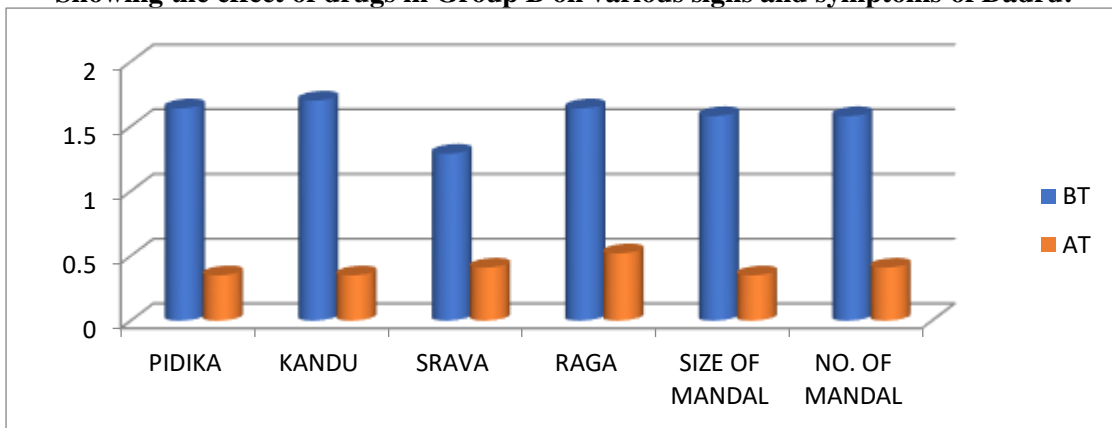
A total of 20 patients were registered in each group. In Group A, 18 patients had completed clinical trials and 2 patients were dropped out. In Group B, 17 patients had completed clinical trials and 3 were dropped out. In Group C, 19 patients had completed clinical trials and 1 dropped out. The data collected and compiled from this clinical trial were sorted out and processed further by subjection to varied statistical methods and presented in tabular form in the following sequence.

**GENERAL DATA OF 54 PATIENTS OF DADRU IS SHOWN AS FOLLOWS:
Showing the effect of drugs in Group A on various signs and symptoms of Dadru:**



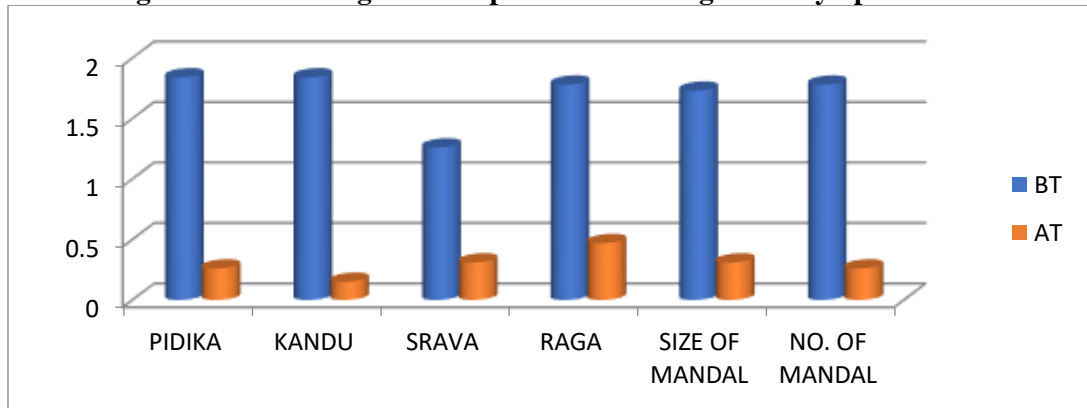
From the above table, it can be observed that the effect of Khadir Bark Churna is highly significant at the level of $P < 0.001$ in Pidika, Kandu, Srava, Raga, Size of Mandal, and No. of Mandal and % relief is 81.81, 85.29, 72.72, 68.75, 79.41, and 78.78 respectively.

Showing the effect of drugs in Group B on various signs and symptoms of Dadru:



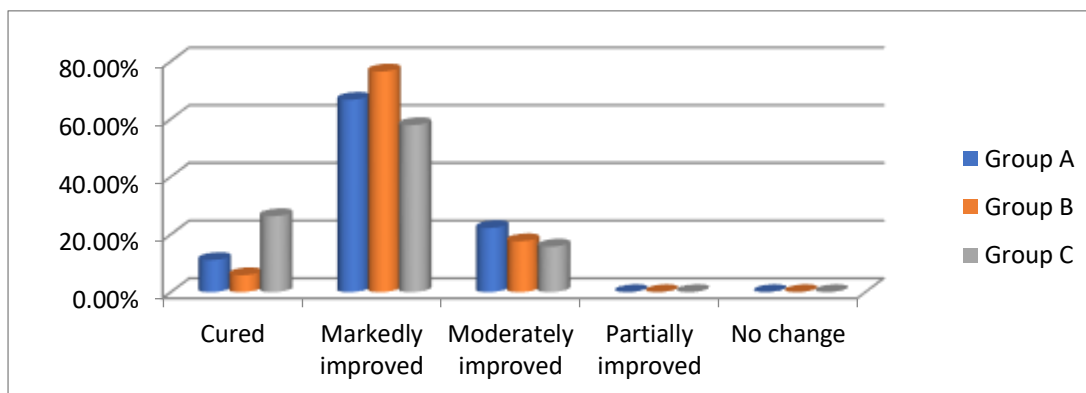
From the above table, it can be observed that the effect of Neem Bark Churna is highly significant at the level of $P < 0.001$ in Pidika, Kandu, Srava, Raga, Size of Mandal, and No. of Mandal and % relief is 78.57, 79.31, 68.18, 67.85, 77.77, and 74.07 respectively.

Showing the effect of drugs in Group C on various signs and symptoms of Dadru:



From the above table, it can be observed that the effect of Khadira Bark Churna and Neem Bark Churna is highly significant at the level of $P < 0.001$ in Pidika, Kandu, Srava, Raga, Size of Mandal and No. of Mandal and % relief is 86.21, 89.41, 74.50, 72.31, 84.67, and 82.17 respectively.

Results



Regarding the overall effect of Trial Drugs in all three groups, it is evident from the above table that 14.81% of patients were completely cured, 66.66% of patients were markedly improved, and 18.51% of patients were moderately improved with the treatment.

Table: - Showing the comparative effect of trial drugs on Dadru after treatment: -

Sign & Symptoms	Percentage relief		
	Group A	Group B	Group C
Pidika	81.81	78.57	86.21
Kandu	85.29	79.31	89.41
Srava	72.72	68.18	74.50
Raga	68.75	67.85	72.31
Size of Mandal	79.41	77.77	84.67
No. of Mandal	78.78	74.07	82.17

DISCUSSION

The present research work has been carried out with a view to provide a scientific basis for the claims made in various Ayurvedic texts regarding the Dadrugna property of *Khadira Bark Churna* and *Neem Bark Churna*. The drugs were subjected to clinical and experimental studies. The study comprises drug review, disease review, pharmacognostical study, phytochemical study, and pharmacological study. The various classics of Ayurveda have described the therapeutic role of *Khadira* and *Neem* in many diseases, especially in the treatment of *Dadru*.

DRUG REVIEW: The various classics of Ayurveda have described the therapeutic role of *Khadira* and *Neem* in many diseases, especially in the treatment of *Dadru*.

KHADIRA: *Acacia catechu* Willd.

In Charaka Samhita *Khadira* is classified as *Kusthaghna Mahakashaya*^[7], Udardaprashamana Mahakashaya along with Kashaya skandha. It can be consumed in churna form as well as decoction. Churna of *Khadira* bark has Dadru, Kilas, Kitibha, Pama, and *Kusthaghna* properties^[8]. खदिरः कुष्ठघ्नानां I (Ch. S.Su. 25/40) *Khadira* is described under the group of *Salasaradi gana*^[9] according to Acharya Sushruta. The Gana is also indicated in *Kustha*. Prameha has Pandu roga nasak properties.

NEEM: *Azadirachta indica* A. Juss.,

In Charaka Samhita, *Neem* is classified as *Kandughna Mahakashaya*^[10] (the great decoction destroying itching) and also in the group of bitters i.e., Tik-taskandha. *Nimba* also comes by the synonyms *Arista*

(harmless) and *Pichumarda* (alleviating skin diseases including leprosy). Kwatha of Nimba-bark (Mahatik-tak ghrita) has Kushtha, Raktapitta. Visarp, Pandu roga, Pama, *Kandughna* properties.

त्रिफलापटोलपिचुमर्दपर्पटकमकुष्ठानि
रक्तपित्त..C.S.Chi.7/144-150

Sushruta has included *Nimba* under the group of Aragvadhadi Gana especially for 'Kusthaghna, Kandughna^[11]' and Vrana Shodhana, Guduchyadi Gana, 'Lakshadi Gana' especially for Kusthaghna and Krimighna. These Gana are also indicated in diabetes and Skin diseases.

Disease Review:

Table - Literary Survey of Kushtha and Dadru:

Literature	Reference of Kushtha	Reference of Dadru
Veda	Rigveda (1/32/2), Atharva Veda (7/74) Brahmana literature	Atharva Veda
Purana	Agni Purana (120/3) Garuda Purana (175-176, 194-198)	
Smriti	Manu Smriti	
Samhitas	Charaka Ni. 5, Chi. 7	Charaka Chi. 7
	Sushruta Nidana Sthana 5, Ni.13	Sushruta Nidana Sthana 5
	Harita 3 rd Sthana 39 th Chapter Kushtha Chikitsa	Harita 3 rd Sthana 39 th Chapter
	Kashyapa Chi. Sthana, Kushtha Chikitsa (page116)	Kashyapa Chi. Sthana, Kushtha Chikitsa (page116)
	Bhel	Bhel Chi. 6
Samgraha	A.S.Ni. 14	A.S.Ni. 14/9-10
	A.H.Ni. 14	A.H.Ni. 14
	Madhava Nidana Chapter 49	Madhava Nidana Chapter 49

Dadru is mentioned under Kshudrakushta because of its relapsing nature, mild signs, and symptoms, local infection, and superficial in nature. Spreads slowly if not treated and its treatment is not difficult. As per the classical signs and symptoms of Dadru, it can be equated with Dermatophytosis.

SAMPRAPTI (PATHOGENESIS):

According to Charak Samhita, Due to various Nidana Sevana, Tridosha gets vitiated simultaneously & produces *Shaithilya* in the *Twaka, Mamsa, Rakta, and Ambu*. Then *Tridosha* gets seated in *Sithila dhatu* and vitiates them with *Lakshanotpatti* of *Kushtha Roga*.

Overall Effect of therapy:

The data on the total effect of therapy was provided.

- ✓ Cured 8 patients (14.81%).
- ✓ Marked improvement in 36 patients (66.66%).
- ✓ Moderate improvement was obtained in 10 patients (18.51%).
- ✓ Out of 54 patients, there was no case of partial improved.
- ✓ No effect of therapy was found in 0% of patients.

PROBABLE MODE OF ACTION:

According to Acharya Charak, Dadru is Kapha Pitta Pradhan Tridoshaj Vyadhi, which causes itching, Pidikha, Inflammation, and Rag or Fainting of Skin. Dermatophytosis is a fungal disease. Both drugs *Khadira* and *Neem* have *Kapha Pitta Shamaka property*. So, the Kapha Pitta Shamaka properties of the drugs minimize the symptoms of disease and act as follows.

Probable mode of action of group A drugs:

Khadira has Kushtghna action. Its properties and actions are explained as follows:

- **Tikta Rasa** of *Khadira* has *Kandughna, Kusthaghna, Krimighna, Dahaprashamana*, etc. properties, it controls Dadru effectively.
- **Kashaya Rasa** of *Khadira* having *Ropana, Savarnikarana, Pitta Kapha shamaka*, etc. properties, it controls Dadru effectively.
- By **Laghu Guna** property it enters each cell, and Srotas of the Body and thus corrects the Sroto and Dhatus dusty by its actions like *Pachana, Shodhana, Kleda prasadana, Vishada*, etc.
- By **Ruksha Guna** property it controls Kapha dosha thus helping in combating Dadru.

- **Sheeta Virya** of drug pacifies Pitta and Rakta. Both Pitta and Rakta play an important role in inflammation. It stops secretion due to Vishyandana properties.

- **Katu Vipak** of the drug pacifies Kapha dosha.

Probable mode of action of group B drugs:

The mechanism by which the drug helps in combating Dadru may be said on the basis of clinical trials by its Kusthaghna action. Its properties and actions are explained as follows:

- **Tikta Rasa** of Neem has Kandughna, Kusthaghna, Krimighna, Dahaprashamana, etc. properties, and it controls Dadru effectively.

- **Kashaya Rasa** of Neem having Ropana, Savarnikarana, Pitta Kapha shamaka, etc. properties, it controls Dadru effectively.

- **Katu Vipak** of the drug pacifies Kapha dosha.

Probable mode of action of group C drugs:

- It has also Kushthaghna and Kandughna action.
- These drugs accelerate Kushthaghna's action better than the other two groups' drugs, it may be said on the basis of clinical trials.

It may be the synergistic effect of both drugs when used together.

CONCLUSION

At the end of the study, the following conclusion can be drawn on the basis of observations made, results achieved and thorough discussion in the present context and it can be summarized as below: Dadru is a type of Kushtha. Neem Bark Churna possesses good Kushthaghna, Kandughna, and Krimighna properties. It has antifungal, antimicrobial, anti-inflammatory, antioxidant, etc. activities which play an important role in Kushtha. Khadira Bark Churna is Dadru nashak by its Kushthaghna, Kandughna, and Krimighna properties. It has antifungal, antimicrobial, anti-inflammatory, antioxidant, etc. activities which play an important role in Kushtha. On the basis of these findings, it can be concluded that both drugs while used together are more effective than separate use. Lastly, it may be concluded that this was a pilot study done with the help of very limited resources, yet it has been tried up to the best effort to perform all studies very scientifically and carefully.

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