

A Critical Study of *TvakSharir* with special reference to *Dadru*

Lade Vaibhav^{1*}, Chandurkar Nitin², and Kamble Amar³

^{1, 2, 3}Department of RachanaSharir, D.Y. Patil College of Ayurved and Research Centre, Pune, MS, India

Abstract

Tvak Sharir and their diseases have great importance as skin diseases are easily noticeable and a cause of great social concern to the patient. *Tvak* is defined as the organ which covers the external surface of the body. *Ayurvedic* literature has described "*Tvak Sharir*" along with various types of *Kushtha*. There are eighteen types of *Kushtha* described in *Ayurved*, *Dadru* is one of them. *Sushruta* mentioned *DadruVyadhi* in *Mahakushthawhile Charakahas* mentioned in *KshudraKushtha*. According to pilot study from various *Samhitas* and modern literature it is seen that, the symptoms of '*Dadru*' and Dermatophytosis (*Tinea/Ringworm*) shows tremendous similarities with each other. The co-relation of '*Dadru*' and '*Dermatophytosis*' is done on the basis of similarities of the symptoms and results of histopathological investigation. The result found are '*Dadru*' and Dermatophytosis have almost all the sign and symptoms which are correlated on the basis of literary and clinical study of both *Ayurved* and Modern science. *Dadru* (i.e., '*AsitetarDadru*') is superficially limited; similarly Dermatophytosis is confined to Stratum Corneum with some anatomical changes. Skin biopsy shows keratinized stratum corneum having some inflammation. From this examination we conclude that Dermatophytosis is superficial fungal infection.

Keywords

Tvak Sharir, Dadru, Dermatophytosis



Greentree Group

Received 14/10/16 Accepted 15/02/17 Published 10/03/17

INTRODUCTION

Ayurved is the most ancient system of medicine in the world. *Ayurved* advocates a complete promotive, preventive and curative system of medicine and it has been practiced since ancient time in the form of eight major clinical specialties. In *Ayurvedic* science 'Tvak Sharir' has an important place.

Tvak is the main seat of *VataDosh* and it is among the *Panchadnyanendriya* which has function of sensation. According to *Charaka* and *SushrutaSamhita*, the layers of *Tvak* are six and seven, respectively. *Ayurvedic* literature has described "Tvak Sharir" along with various types of *Kushtha* (skin disorders) according to layers of skin.

According to *Sushruta*, the fourth layer of *Tvak* is *Tamra* measuring one-eighth of *Vrihi* and is the seat of various types of *Kilas* and *Kushtha*. The fifth layer is *Vedini* measuring one-fifth of *Vrihi* and is seat of *Visarpa* and *Kushtha*¹.

There are eighteen types of *Kushtha* described in *Ayurved*. Out of them seven are *Mahakushtha* and eleven are *KshudraKushtha*.

Sushruta mentioned *DadruVyadhi* in *Mahakushtha* which is characterized by more itching sensation as like pain. In *DadruVarnaa* of *Tvak* looks like as *Atasi*

flower or as *Tamra*, which are spreading in the nature and are associated with *Pidaka* (pimples)².

Charaka described *Dadru* in fourth layer of *Tvak* and included under *Kshudra-Kushtha*. According to *CharakaSamhita* the clinical description of *DadruKushtha* is *UdagataMandala* (raised patch) associated with *Kandu* (itching), *Raga* (redness) and *Pidaka* (pimples)³.

NEED OF THE STUDY-

In today's era, people are getting more and more consciousness about healthy skin. Hence to fulfill people's demand and give them healthy skin, one must study the Anatomy and Physiology of skin and it's variation from one person to another because every individual have different nature of skin depending upon his *Prakruti* and many other factors.

Skin conditions can be seen in 10% to 30% of outpatients in any hospital. Skin diseases are easily noticeable, so this is a cause of great social concern to the patient. Very often, skin diseases offer diagnostic clue to many major systemic disorders⁴. There is another reason for doing extensive study of 'Dadru' which can be compared to 'Dermatophytosis' (Tinea/Ringworm)

according to modern science. *Dadru* is a common worldwide public health problem. *Dadru* causes considerable discomfort. Hence there is a need to find the views of *Ayurved* and modern science for betterment of health of peoples. Efforts are needed to reevaluate the concepts of “*Tvak Sharir*” with special reference to “*Dadru*” *Vyadhi*. Hence this study is an attempt to clarify the concept of *DadruVyadhi* according to *Ayurved* and modern science.

AIMS AND OBJECTIVES

AIMS:-

1. To study *Tvak Sharir* according to *Ayurved* and Modern science.
2. To study *Samprapti* (pathophysiology) of *DadruVyadhi* according to *Ayurved* and modern science.
3. To study the changes in the skin layer because of *DadruVyadhi* according to *Ayurveda* and modern science.

OBJECTIVES:-

1. To compile references about *Tvak Sharir* from *AyurvedSamhitas*.
2. To compile references about *Dadru* with respect to *Tvak Sharir* from *AyurvedSamhitas*.

3. To categorize references regarding *Tvak Sharir* and *Dadru*.
4. To obtain observation from clinical assesment of patients taken for study having symptoms of *Dadru&Dermatophytosis*.
5. To draw conclusion on basis of clinical study & discussion.

INCLUSION CRITERIA:

- 1) Subject selection has been done irrespective of work, social economic status, age and sex.
- 2) Subject having sign and symptoms of ‘*Dadru*’*Vyadhi*.
- 3) Previously diagnosed cases of *Dadru* have been taken for study.
- 4) Willing for participating in study.

EXCLUSION CRITERIRIA:

- 1) Subjects having sign and symptoms of ‘*Dadru*’*Vyadhi* but not willing for study will be excluded.
- 2) Skin conditions other than *Dadru*.
- 3) Skin conditions with other serious complications and having major systemic diseases like HIV, SLE, and Tuberculosis etc.

MATERIAL & METHODS

This study has been done under three sections.

1. Literary Study
2. Clinical Study
3. Histopathological Study

1) LITERARY STUDY

All the information regarding '*Tvak Sharir*' is collected from *Brihatrayi*, *Laghutrayi* and other classics of *Ayurved*. Definition of '*Tvak*', its etymology, genesis and synonyms are compiled from different texts. Compilation of number, names and *Vyadhi* occurring in various layers of *Tvak* is done and their comparative study is done. Comparative study of thickness of *Tvak* told by *Sushruta* and *Dalhana* is done. Also relations of *Tvak* with other factors like *Doshas*, *Dhatu*s, *Malas*, *Upadhatu*, *Srotasa*, *Varna*, *Prakruti*, *Sara* and *Dnyanendriya* have been studied.

In case of modern aspect of '*Tvak*', all the information regarding Anatomy of skin is compiled from different textbooks of Anatomy. Study of embryology of skin, its layers, functions and glands was done. Also study of '*Dadru*' *Vyadhi* from all the *Samhitas* was done. The causative factors of '*Dadru*', its symptoms, *DoshaPradhanya* and classification have been studied. Review of previous work done on same topic by scholars has collected

through research papers, journals, internet etc. Compilation of information regarding Dermatophytosis (*Tinea/Ringworm*) was done from the textbooks of Dermatology, clinical medicine, textbooks of pathology etc.

This compilation includes study of causative factors, pathogenesis, symptoms, clinical features and relevant investigations. Finally, the co-relation of '*Dadru*' and '*Dermatophytosis*' was done on the basis of symptoms and results of histopathological investigation.

2) CLINICAL STUDY:-

This study was done at various skin clinics under the guidance of Dermatologist. Thirty patients diagnosed with '*Dermatophytosis*' (*Tinea/Ringworm*) were examined for the clinical study of the disease. The morphology of '*Tinea*', its symptoms, areas of predilection was studied. The patients were convinced for the biopsy of skin to rule out whether the stratum corneum alone gets affected in this disease. Photographs of patients were taken to show the morphology of Dermatophytosis infection. Also scrapping of infected parts was done and processed with KOH to rule out the fungii (microorganism).

3) HISTOPATHOLOGICAL STUDIES

It is done in following ways

A. Potassium Hydroxide (KOH)

Examination: Potassium hydroxide dissolves the keratin of keratinocytes, hairs and nails but does not dissolve the fungus. It includes two methods.

- 1) KOH mounts (without heating)
- 2) KOH preparation (with heating)

This experiment is done by KOH preparation.

Indications - Infection with fungi or yeast is suspected, e.g. Dermatophytosis (ringworm), tinea versicolor, candidiasis, etc.

Steps Involved

1. Using a no.15 scalpel blade, scraping has taken from the border of lesions, involved nails or infected hair has extracted with forceps.
2. First 1 to 2 drops of 10 to 20 % potassium hydroxide (KOH) is placed on a clear glass slide. Then collected specimen of scales is immersed in drop of KOH. Cover slip is kept on the specimen. KOH mixture is heated by passing the slide through a Bunsen burner flame several times to dissolve the scales which facilitate identification of fungal hyphae. The slide is

then examined under the light microscope (10x and 40x).

Interpretation

1. Dermatophytes appear as septate branching hyphae in the scales or hyphae (fig.1) and spores in hair shaft.
2. Malassezia furfur (Pityrosporum ovale) the causative agent of tinea versicolor is seen as short stumpy mycelia elements with thick walled rounded spores-(Spaghetti and Meat balls appearance). (fig. 2)
3. Candida is seen as thin filamentous mycelial elements with pseudobudding and spores.



Fig.1

b. Skin Biopsy:

Indications:

1. The most important investigation in dermatology is biopsy of the lesion. A lesion may mimic many dermatoses and a definitive diagnosis can only be made on biopsy. (fig.3)
2. Skin biopsy may be used for a variety of investigative procedures such as ultra-structural examination, immuno-

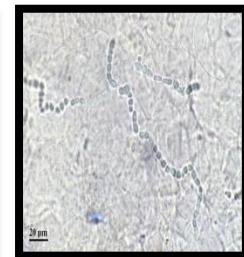


Fig. 2

fluorescence studies, enzyme histochemistry and immuno-histo-chemistry, microbiological studies, tissue culture etc.

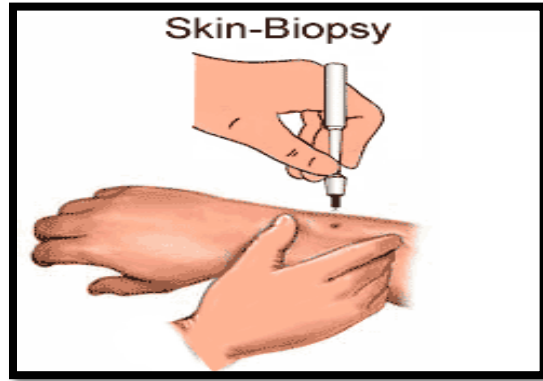


Fig. 3

Site of Biopsy:

The untreated lesions have taken for biopsy which is representative of the skin disorder as whole. Written consent is normally obtained from the patient and local anesthesia with 1% or 2% lignocaine with or without adrenaline is injected around the biopsy site.

Techniques of Skin Biopsy:

Elliptical surgical biopsy, punch biopsy, curettage or shave biopsy may be undertaken.

Punch biopsy is taken for this experiment (fig.4)

The biopsy punch of at least 5 mm is required to obtain satisfactory specimen. The punch is pushed into the skin with a downward twisting movement and then removed. The tissue specimen is lifted and

cut. The wound may be left to heal without suturing. The biopsy specimen is put in 10% formalin solution for histopathological studies. It is properly labeled and sent to pathology department with full clinical details of the case.

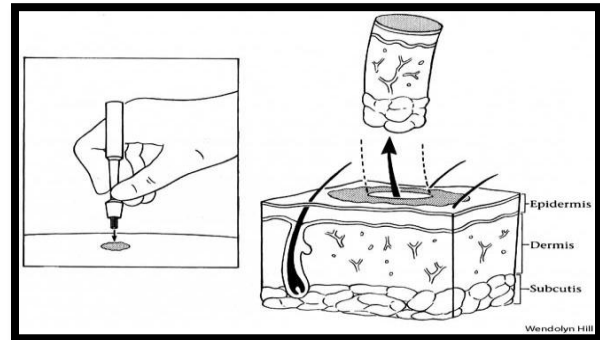


Fig.4

OBSERVATIONS

1. There is some controversy regarding number of *Twacha*. Some *Acharya's* have informed six types of *Twacha* while some have told 7 types.
2. *Acharya Charaka* and *Acharya Sushruta* both have given different *Vyadhi* in layers of *Twacha*. e.g. *Charaka* said '*Dadru*' has four layers of *Twacha* and included it under *Kshudrakushtha*. While *Sushruta* mentioned that fourth layer i.e., '*Tamra*' is seat of *Kilas* and *Kushtha*. The fifth layer i.e., '*Vedini*' is seat of *Visarpa* and *Kushtha*. *Sushruta* described '*Dadru*' under *Mahakushtha*.
3. Measurement of thickness of *Twacha* given by *Sushruta* is near about same which

is quoted in modern textbooks. The measurement of *Dalhan* doesn't matches with the concepts of modern science.

4. The symptoms of 'Dadru' and Dermatophytosis (Tinea/Ringworm) show tremendous similarities with each other

Table 1 :-

No.	Title	Dadru	Dermatophytosis(Tinea)
1	Colour	<i>Tvak</i> looks like as <i>Atasi</i> flower or as <i>Tamra</i> . (table 1A & graph 1)	Red, copper, gray, black
2	Signs and Symptoms	<i>UdagataMandala</i> (raised patch) associated with <i>Kandu</i> (itching), <i>Raga</i> (redness), <i>pidka</i> (pimples) (table 2B & graph 2)	Itchy, annular, erythematous, Papulo-vesicular scaly lesions With central clearing.
3	Areas of Predilection	All over the body (table 3C & graph 3)	Skin all over the body, depending upon the site of involvement e.g. face-Tineafaciei.
4	Location	<i>Charaka</i> told 'Dadru' in fourth layer of <i>Twacha</i> , of <i>Madhavanidana</i> , Deep rooted i.e. <i>AsitaDadruis</i> included under <i>Mahakushta</i> whereas superficially occurring <i>Dadru</i> . <i>eAsitetarDadru</i> is included under <i>Kshudrakushtha</i>	Superficial fungal infections (confined to stratum corneum) Deep fungal infections (invade deeper tissues)

Histopathological Study:

-Histopathological studies were performed by KOH preparation method in which

Varna	No. of Patients	Percentage
<i>Shweta</i>	02	6.5%
<i>Tamra</i>	20	66.5%
<i>Pita</i>	01	3.5%
<i>Shyava</i>	07	23.5%

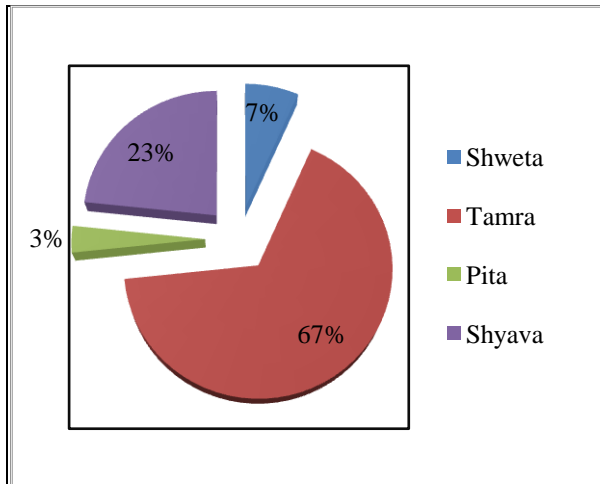
Dermatophytes appear as septate branching hyphae in the scales.

Skin Biopsy: shows following changes,

(Table 1) . Their similarities, distributions and presentations tubular (table 1A, 1B,1C) and graphical presentation (graph1,2,3) are as follows:

- 1) Mild epidermal changes such as focal intercellular edema and varying amounts of dermal inflammation are seen.
- 2) The fungal elements are readily seen in sections stained by the periodic acid-Schiff's (PAS) reagent.
- 3) Dermatophytes are superimposed on inflammatory lesions of the skin.

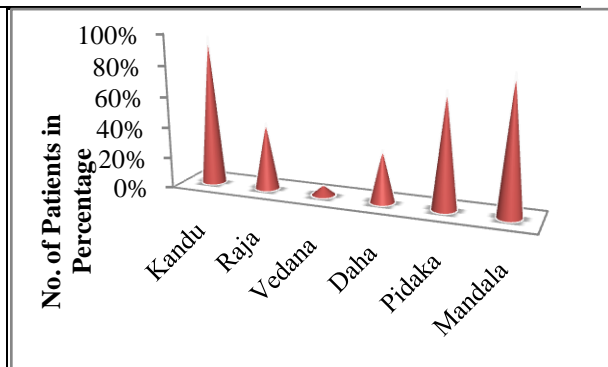
Table 1A Varna wise distribution of *Dadru*



Graph 1 Varna of Dadru

Table 2B Lakshanas wise distribution of Dadru

Lakshanas	No. of Patients	Percentage
Kandu	29	96.5%
Raja	13	43.5%
Vedana	02	6.5%
Daha	10	33.5%
Pidaka	22	73.5%
Mandala	23	86.5%



DISCUSSION

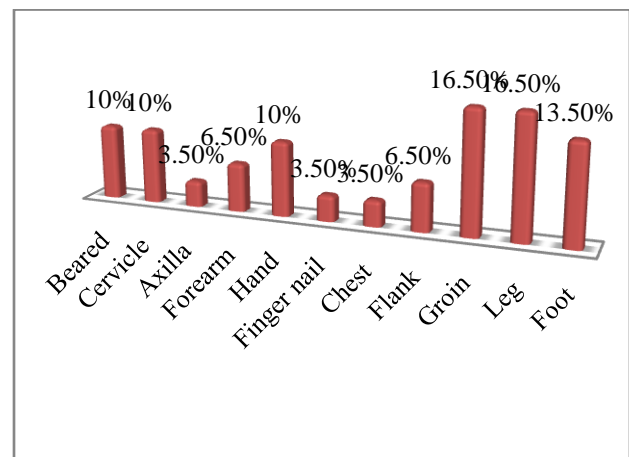
1. Discussion on Review of Tvak Sharir and anatomy of skin:-

According to *Ayurveda*, *Tvak* is the organ which covers the external surface of the body. Modern science also defined skin as external covering of the body. Thus from the

Graph 2 – Lakshanas wise distribution

Table 3C Vyaktisthana (Area of Predilection) wise distributions

Area	No. of Patients	Percentage
Beard	03	10%
Cervical	03	10%
Axilla	01	3.5%
Forearm	02	6.5%
Hand	03	10%
Finger nail	01	3.5%
Chest	01	3.5%
Flank	02	6.5%
Groin	05	16.5%
Leg	05	16.5%
Foot	04	13.5%



Graph 3 Area of Predilection

above statements; we can show that, the *Tvak* according to *Ayurved* and skin according to modern science shows resemblance between each other. According to *Sushruta*, *Tvak* gets developed in the form of layers on the surface of *Garbha*, just like cream gets formed on heating milk⁵. Modern

science has also given development of skin in the form of layers⁶. According to *AyurvedTvak* reflects *Varna* of an individual⁷, which shows similarity with modern science in the form of melanin pigments present in skin which determines the colour of the individual⁸.

Tvak is one of the *Dnyanendriya* which is of *Vyavayi* in nature. Its abode is *Sparshnendriya* which is responsible for the touch sensation⁹. Alike the above quotation, modern science has also consider, skin as sensory organ, which is also responsible for the touch sensation¹⁰.

Thickness of *Tvak* told by *Sushruta* and *Dalhana* is having great difference; *Sushruta* seems to be more accurate in telling thickness of *Tvak* which is more or less same to the thickness quoted in modern textbooks of Anatomy.

Skin is composed of sweat glands, hairs, nails and numerous openings. Skin is supplied by sebaceous glands which keep the skin surface oily and sweat glands which excrete waste materials of the body through sweat¹⁰.

Skin is having protective functions, helps in general sensation, in excretion of waste products of metabolism, synthesizes vit-D,

and maintains water balance and stores fats, water and salts.

It is divided into two layers outer epidermis and inner dermis. The epidermis starting from above inwards comprises of four clear layers that can be seen through a light microscope. These are: cornified layer (stratum corneum), clear layer (stratum lucidum), granular layer (stratum granulosum), spinous or prical cell layer (stratum spinosum) and basal layer (stratum basale). The dermis is 20-40 times thicker than the epidermis. It is divided into two layers from deep to superficial as follows - S Reticular layer and papillary layer¹⁰. These 7 layers of skin can be correlated with 7 layers of *Sushruta*, on the basis of their number, thickness, function and diseases occurring in it, e.g. according to *SushrutaVedini* is the 5th layer of *Tvak* and it is the seat of *Kushtha* and *VisarpaVyadhi*. According to modern medicine in diseases resembling *Kushtha* and *Visarpai*. e. leprosy and systemic lupus erythematous, nerve ending are involved. These nerve endings are present in papillary layer. Hence *Vedini* can be correlated with papillary layer.

2. Discussion on Review of *Dadru* and Dermatophytosis:-

According to *CharakaDadru* is a type of *Kushtha* which occurs in fourth layer of *Tvak*. It has predominance of *Pitta* and *KaphaDosha*. It is characterized by raised patches associated with itching, redness and papules. According to *SushrutaDadru* is spreading in nature and has colour like *Tamra* or *Atasipushpa*

Modern science explained that the dermatophytosis is Keratinophilic, so they grow in the Keratin of the Stratum Corneum, layer of skin¹¹.

Clinical features of Dermatophytosis are intense itching, annular erythematous scaly lesions, the active border consist of papulovesicular lesions, and in advancing stage the lesions spread peripherally with central clearing and pigmentation¹¹. Similarly *Mudhukoshkara*, a commentator of '*Madhavanidana*' stated '*AsitetarDadru*' which occurs superficially having *Lakshana-Kandu* (itching), *Raga* (redness), *Pidaka* (pimples) and *UdagataMandala* (raised patch)¹².

Thus from the above statements, one can say that the '*Dadru*'*Kushtha* according to *Ayurved* and Dermatophytosis of modern science shows symptoms wise resemblance between each other.

Kushtha in *Ayurved* and Dermatophytosis of modern science is a contagious disease. Most of the predisposing factors from modern science are already explained in *Ayurveda*. Factors affecting are heat, humidity, tropical climate, poor nutrition, hygiene and also sharing of personal articles like cloths, comb, blades, cap, bed etc. *Trichophytonrubrum* is the most common dermatophyte responsible for Dermatophytosis. According to *Ayurveda* there is no such microorganism but *Hetusevan* which vitiates *Pitta* and *KaphaDosha* are responsible for *Dadru*.

It is seen that *Charaka* and *Sushruta* have no uniformity in classifying the kinds of *Kushthae.g.Dadru* and *Sidhma* is included under *Mahakushtha* and *Kshudra-kushtha* by *Sushruta* and *Kshudra-kushtha* and *Mahakushta* by *Charaka* respectively.

MadhukoshTika of *Madhavanidana* has clarified and stated that a deep rooted *Dadru* (i.e.*AsitaDadru*) is included under *Mahakushta*¹² whereas superficially occurring *Dadru* (i.e.*AsitetarDadru*) is included under *Kshudra-kushtha* by *Charaka*.

Skin Biopsy of lesions shows keratinized stratum corneum. there is no living tissue invaded, shedding of the stratum corneum is

increased by inflammation. From this examination we can say that Dermatophytosis is superficial fungal infection.

CONCLUSION

From the detailed conceptual compilation, critical review, clinical observations and discussion the following conclusion are evolved.

- *Tvak Sharir* according to *Ayurved* and Anatomy of skin in modern science can be correlated on the basis of thickness, function, morphology and diseases affecting it.
- '*Dadru*' *Vyadhi* a type of *Kushtha* and Dermatophytosis a type of skin diseases have almost all the similar sign and symptoms which are correlated on the basis of literary and clinical study from both *Ayurveda* and Modern point of views.
- *Dadru* (i.e. '*AsitetarDadru*') is superficially limited; similarly Dermatophytosis is confined to Stratum Corneum with some Anatomical changes.
- '*Dadru*' i.e. '*AsitetarDadru*' in *Ayurveda* is nothing but Dermatophytosis (Tinea/Ringworm) in modern science. *Dadru* is common disorder affecting large number of people. This disease can be cured with the

help of local as well as systemic treatment modalities. *Ayurved* has described variety of local treatment modalities like *Lepa*, *Parisheka*, *Dhupan*, *Snehan*, *Panchakarma* etc.

- For understanding the pathology of such disease as well as role of local treatment modality in this disease, it becomes essential to know *Tvak Sharir* and *Dadru* in detail. Thus the present study will be helpful in the treatment of *Dadru*.

REFERENCES

1. VaidyaYadavjiTrikamjiAcharya, SushrutaSamhita of Sushruta with the Nibandha Commentary by Dalhanacharya, ChaukhambaSurbhartiPrakashan, Varanasi, 1997 sharirsthan chapter 4 shlok no.4, page no.355.
2. VaidyaYadavjiTrikamjiAcharya, SushrutaSamhita of Sushruta with the Nibandha Commentary by Dalhanacharya, ChaukhambaSurbhartiPrakashan, Varanasi, 1997. . Nidansthan 5 shlok no. 8 page no. 284.
3. VaidyaYadavjiTrikamjiAcharya, The Charaka –Samhita of Agnivesh, revised by Charaka,charaksamhita, Varanasi, chaukhambapublishan 2011, Nidansthan 5 shlok no.6, page no. 217and chikitsasthanchapeter 7,shlok no. 9, page no. 450
4. Berth Jone’S J; Rook’s textbook of Dermatology, Eczema,Lichenification,Prurigo&erythroderma. Edition 8th UK, Blackwell publishing ltd 2010 chapter 17.
5. VaidyaYadavjiTrikamjiAcharya, SushrutaSamhita of Sushruta with the Nibandha Commentary by Dalhanacharya, ChaukhambaSurbhartiPrakashan, Varanasi, 1997 sharirsthan chapter 4 shlok no.4, page no.355.
6. Gray’s Anatomy; editor in Chief Susan Standring; Elsevier Churchill Livingstone; 39th edition. 2005, chapter 8 , page no. 157.
7. VaidyaYadavjiTrikamjiAcharya, SushrutaSamhita of Sushruta with the Nibandha Commentary by Dalhanacharya, ChaukhambaSurbhartiPrakashan, Varanasi, 1997.Nidansthan1
8. Gray’s Anatomy; editor in Chief Susan Standring; Elsevier Churchill Livingstone; 39th edition. 2005, chapter 8 , page no. 158.
9. VaidyaYadavjiTrikamjiAcharya, SushrutaSamhita of Sushruta with the Nibandha Commentary by Dalhanacharya, ChaukhambaSurbhartiPrakashan, Varanasi, 1997,.Nidansthan 1 shlokno. 17.
10. Gray’s Anatomy; editor in Chief Susan Standring; Elsevier Churchill Livingstone; 39th edition. 2005, chapter 8 , page no. 160 -171.
- 11.Monsoon’s tropical disease – edited by Gordan c. cook &alimuddinzumala , Saunder’s Elsevier Science, London edt 21st2003 chapter 69, by R.J.Hay page no. 1173-1176.

12. MadhavaNidana – by MadhavaKara,
Madhukosha Sanskrit commentary by
ShriVijayrakshita, Shrikanthadatta and
Vidyotini Hindi commentary by
Y.N.UpadhyayaChaukhamba Sanskrit
Sansthan, Varanasi..Kushthanidan 49 page
no 625 ,shlok no 20 /10-16, part 2.