



Skin disorders (*twak rogas*) revealed in the *Atharvaveda*: Descriptions of medicinal plants and utilization

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Received: 17 January 2022 / Accepted: 27 March 2022 / Published online: 7 June 2022
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Abstract

In the *Atharvaveda*, two distinct words are mentioned namely, the *krimi* and *kṛmi*. The word *kṛmi* means insect (*kīṭakamu*) and whereas *krimi* refers to worm/germ. It mentions a large number of skin diseases, both of major and minor types, caused by the micro-organisms (*krimi*), which are of human concern. It describes the skin diseases, *twak rogas*, in the name of *takman*, *yakṣma*, *kuṣṭa*, *kilasa*, *palita* and *śvitra*, having grey and white spots, generally from deeper layers of skin and refers herbal remedies for them. A deep knowledge of the herbs and their various medicinal properties can be inferred from many of the *Atharvaveda* hymns for skin disorders. In this article, the human skin diseases revealed in the *Atharvaveda*, their classification, causative factors, liturgies and a number of herbal medical remedies with special reference to skin disorders are discussed.

Keywords *Atharvaveda* · *Kilasa* · *Kuṣṭa* · Medicinal herbs · Microorganisms · Skin diseases · *Śvitra*

1 Introduction

The first ever historical material about skin and its diseases are revealed in the *R̥gveda*. The mention of skin diseases in the *R̥ks* 1–117–7, 1–117–19 and that of the hair in *R̥ks* 1–126–7 and some liturgies related to them in 8–80: 5 & 6 are worth mentioning. The humans have been battling microorganisms since before our species had even evolved into its modern form. The *Atharvaveda* (*AV*) is a curious compendium of medicine in its various stages of evolution and contains the most primitive as well as some of the most highly developed stages of therapy. In the *AV*, the word ‘*brahma*’ is used in the sense of physician, whereas the word ‘*bhiṣak*’ is used in the *Yajurveda* and ‘*rudra*’ is used in the sense of primordial physician. Among the four vedas, the *Atharvaveda* deals more with various diseases prevalent during that period. Most of the vedic healing verses/liturgies occur in the *Atharvaveda*. The *bhaiṣajya sūktas* (hymns on medicine) which deal with diseases, their causes and cures, show a remarkable insight into the subject of

health sciences. That is the reason that the *Atharvaveda* is considered to be the precursor of Ayurveda or the science of health and longevity. The Ayurveda is listed as an *upaveda* or subsidiary of the *Atharvaveda* (Modak, 1993; Wise, 1986; Dominik, 2003; Khare & Katiyar, 2012). These *sūktas* contain many prayers for health and longevity. Several diseases like fever, leucoderma, leprosy, jaundice, diabetes, dropsy, skin disorders, troubles of the ear, nose and throat, fracture of bones, diseases of the heart and tuberculosis, are mentioned along with their treatments in the *Atharvaveda* and in the later Ayurvedic texts (Karambelkar, 1961). These diseases are caused by germs, violation of the laws of nature, anger of deities and malevolent spirits and sins committed previously. Apart from medicines and physical remedies, use of chants and charms was also in plenty (Ralph, 1896; Bloomfield, 1897).

Skin diseases are numerous and a frequently occurring health problem affecting all ages from the neonates to the elderly and cause harm in number of ways. Maintaining healthy skin is important for a healthy body. Many people may develop skin diseases that affect the skin, including cancer, herpes, cellulitis and others. Medicinal herbs and their parts are frequently used to treat these diseases (Mukhopadhyay, 2013). In Indian context, the development of skin diseases can be divided into four broad time frames: (i) the prehistoric to vedic period, (ii) the post-vedic period,

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(iii) medieval period, and (iv) modern period (Mukhopadhyay, 2016).

The use of plants is as old as the mankind. A deep knowledge of the herbs and their various medicinal properties can be inferred from many of the *AV mantras*/liturgies. The natural forces like the sun and water and human contrivances were all used therapeutically in the vedic era. The mention of leprosy (or some other disease) (*AV* 1–23–1–4 and *AV* 1–24–1–4), jaundice (*AV* 1–22:1–4), disease of the nail (*AV* 2–33–6), and many other verses dealing with wound healing (*AV* 4–12–4 and *AV* 6–57–1 etc.) are also noteworthy. *Atharvavedic* system of medicine is based on the theory of external disease causing agents and discusses little about the internal body mechanisms that work against diseases. It also provides the remedies through various liturgies for respiratory, cholera and other diseases.

2 Classification of microorganisms in *AV*

There are two distinct words mentioned in the *Atharvaveda* (*AV*) which are the *krimi* and *kṛmi*. The word *kṛmi* means insect (*kīṭakamu*) and whereas *krimi* means worm/germ (*AV* 5–23–3, 6), which multiply, enter human bodies and are visible or invisible. In other words, germs like bacteria, viruses, worms and others are referred to as *krimi* and various insects like *kīṭa*, *patamga* are referred as *kṛmi*. The word *krimi* occurs in the *Atharvaveda* for different macroscopic (worms) and microscopic (bacteria, viruses, fungal pathogens) organisms. Based on the above, there are two types of *krimi* viz., *dr̥ṣṭa* (visible/macroscopic) and *adr̥ṣṭa* (invisible/microscopic), described in the *AV* as designated hymns (5–23:1–13) to kill the parasitic germs. A schematic representation on the classification of microorganisms is represented in the Fig. 1.

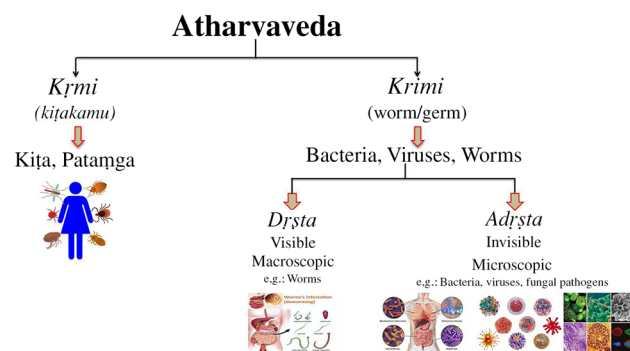


Fig. 1 Classification of microorganisms in *Atharvaveda*

यो अक्ष्यौऽपरिसर्पति यो नासे परिसर्पति ।
दतां यो मध्यं गच्छति तं क्रिमिं जम्भयामसि ॥

yo akṣyau parisarpati
yo nāse parisarpati ।
datām yo madhyam gacchati
taṁ krimiṁ jambhayāmasi ॥

(*AV* 5–23–3)

The *krimis* that are present in the eyes, nostrils, teeth are being destroyed (Griffith, 1895–1896; Bloomfield, 1897).

उत् पुरस्तात् सूर्य एति विश्वदृष्टो अदृष्टहा ।
दृष्टांश्च घ्नन्नदृष्टांश्च सर्वाश्च प्रमृणन् क्रिमीन् ॥

ut purastāt sūrya eti
viśvadr̥ṣṭo adr̥ṣṭahā ।
dr̥ṣṭām̐śca ghnannadr̥ṣṭām̐śca
sarvām̐śca pramṛṇan krimīn ॥

(*AV* 5–23–6)

The sun is the god who is visited by all living beings. He is destroying germs that are invisible to the eye. Both the visible (*dr̥ṣṭa*) and invisible (*adr̥ṣṭa*) *krimis* are being killed by *Āditya* who is rising in the east (Griffith, 1895–1896; Bloomfield, 1897).

3 Causes of skin disorders

The skin disorders vary greatly in symptoms and severity. They can be temporary or permanent, and may be painless or painful. Some have situational causes, while others may be genetic. Some skin conditions are minor, and others can be life-threatening. While most skin disorders are minor, others can indicate a more serious issue. Some common known causes of skin disorders include – bacteria trapped in skin pores and hair follicles, fungus, parasites, or microorganisms living on the skin, viruses, a weakened immune system, contact with allergens, irritants, or another person's infected skin, genetic factors, illnesses affecting the thyroid, immune system, kidneys, and other body systems. Numerous health conditions and lifestyle factors can also lead to the development of certain skin disorders. Some skin conditions have no known cause (Brind'Amour, 2016).

Atharvaveda describes the skin diseases (*twak roga*) in the name of *kilasa*, *palita*, with the clinical picture of grey and white spots, generally from deeper layers of skin and mentions their herbal remedies. Almost all the Ayurveda *saṁhitās* uniformly classified *kuṣṭa* as *mahākuṣṭa* and *kṣudrakuṣṭa*, but there is difference of opinion about the number in each group. The historical perspectives of the *twak rogas* (*kuṣṭa*) were presented according to *R̥gveda*, *Atharvaveda*, Caraka, Suśruta, Vāgbhaṭa, Mādhavakara and Toḍaramalla. In the doctrines of Ayurveda, the *twak rogas* are known by the



general term *kuṣṭa* (Narayana, 1997). The term ‘*kilasa*’ occurs in the *Atharvaveda* and the *Vājasaneyī saṃhita* meaning white leprosy, in which the skin becomes spotted without ulcers, probably a type of tuberculoid leprosy.

3.1 *Takman* (fever and related body aches)

The vedic term *takman* is particular to the *Atharvaveda* (*AV*). The word *takman* is derived from the Sanskrit grammatical root word (*dhātu*)–*ak+matup*, ‘*takati vyāpnōti śarīrē*’ meaning ‘spreading in the body’. It is designated as demonic disease whose characteristics point to fever. *Takman* is the main disease mentioned in the *Atharvaveda*. There is an enormous discussion about it and five *sūktas* (1–12, 1–25, 5–22, 6–20, 7–116) are devoted to this disease. There are different names for the fevers of different durations—*ubhayeṣu* for 2 day’s fever; *trītyaka* for 3 day’s fever; *sadandi* for a long duration fever and *hāyana* for a year’s fever (*AV* 19–39–10).

शीर्षलोकं तृतीयकं सदन्दिर्द्यश्च हायनः ।

तक्मानं विश्वधावीर्याधराञ्च परा सुव ॥

śīrṣhalokaṃ trītyakam
sadandiryascha hāyanah ।
takmānaṃ viśvadhāvīryā
dharāñcaṃ parā suva ॥

(*AV* 19–39–10)

The *takman* that returns on each third day, the one that continues without intermission, and the yearly one, ao thou, (O plant) of unremitting strength, drive away down below! (Bloomfield, 1897, p. 8).

Fever is a disease that spreads in regions. Seasonal variations are also mentioned as causes of diseases, epidemic of *takman* (fever) is at a high level in the rainy season and hence it is known as *vārṣika*.

तृतीयकं वितृतीयं सदन्दिमुत शारदम् ।

तक्मानं शीतं रूरं ग्रैष्मं नाशय वार्षिकम् ॥

trītyakam vitrītyam
sadandimuta śāradam ।
takmānaṃ śītam rūraṃ
graiṣmaṃ nāśaya vārṣikam ॥

(*AV* 5–22–13)

Destroy the *takman* that returns on (each) third day, the one that intermits (each) third day, the one that continues without intermission, and the autumnal one; destroy the cold *takman*, the hot, him that comes in summer, and him that arrives in the rainy season! (Bloomfield, 1897).

The sun dispels diseases and sickness and there are references regarding the germ killing power of sun rays mentioned in *AV* 2–32–1 and *AV* 5–23–6.

उद्यन्नादित्यः क्रिमीन् हन्तु निम्रोचन् हन्तु रश्मिभिः ।

ये अन्तः क्रिमयो गवि ॥

udyannādityaḥ krimīn hantu
nimrocan hantu raśmibhiḥ ।
ye antaḥ krimayo gavi ॥

(*AV* 2–32–1)

The rising sun shall slay worms, the setting sun with his rays shall slay the germs that are within the cow! (Griffith, 1895–1896; Bloomfield, 1897).

In this context, we should recall the fact that Sun was the father of the divine physicians, *Aśvins*. *Atharvaveda* is primarily a charm system in which the charms were systematically accompanied by an ‘amulet’. Thus, there are number of charms to cure number of diseases (Prasad, 2002). According to Karambelkar (1961), the word *takman* may have been a general term for ‘fever’ which could be classified into three types: (i) malarial fever, (ii) influenza and (iii) typhoid fever. The medicinal herb *kuṣṭa* is used to destroy fever. The *kuṣṭa* plant has a power to remedy sickness, pain in the head, affliction in the eye, and ailment of the body. The botanical description of this medicinal plant is described in detail in the section on ‘description of medicinal herbs’.

3.2 *Yakṣma* (consumption/tuberculosis, syphilis)

Yakṣma in the *Rgveda* (1–122–9, 10–85–31) and the *Atharvaveda* (2–10–5, 6; 3–31–1, 5–4–9, 7–7–2, 10–8–3, 7, 10; 12–2–1, 2; 19–36–1; 19–38–1) frequently denotes ‘illness’, in general, perhaps as rendering the body emaciated. *Yakṣma* is the regular *Atharvan* term for disease. *AV* mentions that it is the general internal disease found both in humans and cattle (*AV* 8–7–15, 12–2–1). It is characterized by entering and possessing each and every part of the body (*AV* 6–85–1, 9–8–7 & 9). It causes disintegration of the limbs, fever in the limbs, pain in heart and in all parts of the body (*AV* 5–30–8 & 9, 9–8–5, 13–19, 21 & 22). Majority of writers on Vedic literature believe that *yakṣma* referred to a class of diseases whose principal characteristics were those of consumption/tuberculosis (Prasad, 2002).

नडमा रोह न ते अत्र लोक इदं सीसं भागधेयं त एहि ।
यो गोषु यक्ष्मः पुरुषेषु यक्ष्मस्तेन त्वं साकमधराङ् परेहि ॥

naḍamā roha na te atra loka idaṃ sīsam
bhāgadheyam ta ehi
yo goṣu yakṣmaḥ puruṣeṣu
yakṣmastena tvam sākamadharāṅ parehi ॥

(*AV* 12–2–1)

Together with consumption in the cattle, consumption in our men, in company with that do thou go forth downward (Griffith, 1895–1896; Bloomfield, 1897).



A hundred kinds of *yakṣma* are referred to in the *Vājasaneyī saṃhitā* (12–97) and *ayakṣma* in the *Kāṭhaka saṃhitā* (17–2). In the *Yajurveda saṃhitās* [TS 2–3–5; MS 2–2–7; KS 11–3; SB 4–1–3(9)] an explanation is provided for the origin of the word *yakṣma*, which is distinguished as of three kinds, namely the '*rājayakṣma*' means 'royal *yakṣma*', '*pāpayakṣma*' means 'evil *yakṣma*', and the '*jāyānya*', most probably 'syphilis' according to Macdonell and Keith (1982). The second of the series is elsewhere unknown, and can hardly be defined, for it merely means 'serious or deadly disease'. The germ/*krimi* of *yakṣma* (consumption) arising from excessive cohabitation, flies like a bird from one place to the other and enters the body of a man (AV 7–76–4). Below is the AV liturgy:

पक्षी जायान्यः पतति स आ विशति पूरुषम्।
तदक्षितस्य भेषजमुभयोः सुक्षतस्य च ॥

pakṣī jāyānyah patati
sa ā viśati pūruṣam |
tadakṣitasya bheṣajam
ubhayoḥ sukṣatasya ca ॥

(AV 7–76–4)

Scrofula flies borne on by wings, it penetrates and holds the man. Here is the cure, the chronic and the transient (Griffith, 1895–1896; Bloomfield, 1897).

Scrofula, also called cervical tuberculosis lymphadenitis, is a type of tuberculosis infection. It's caused by the same bacteria (*Mycobacterium tuberculosis*) that cause pulmonary tuberculosis (TB). Tuberculosis is a highly infectious bacterial illness. *Atharvaveda* vividly explained this as *rājayakṣma* (king's evil) in the name of '*jāyānya*' (AV 7–76–3 and AV 7–76–5), *pāpma* (AV 5–22–12) and discusses very elaborately about two main causative factors, varieties (AV 7–76–4) and complications (AV 7–76–3). The treatment for *yakṣma* (*roga cikitsā*) is explained in the AV (3–11:3–5). This is said to lead to death and found to be common among people of *durācara* (bad habits) (Narayana, 1995). A charm to cure scrofulous pustules and scrofula is mentioned in the AV 7–76–3. The word '*jāyānya*' mentioned in AV also resembles consumption/tuberculosis and it breaks ribs, settles in the lungs, harbours in the back and springs from excessive sexual intercourse (AV 7–76–3).

यः कीकसाः प्रशृणाति तलीद्यमवृत्तिष्ठति ।

निर्हास्तं सर्वं जायान्यं यः कश्च ककुदि श्रितः ॥

yaḥ kīkasāḥ praśṛṇāti
talīdya 'mavatiṣṭhati |
nirhāstaṃ sarvaṃ jāyānyam
yaḥ kaśca kakudi śritāḥ ॥

(AV 7–76–3)

The *Jāyānya* that crushes the ribs, that which passes down to the sole of the foot, and whichever is fixed

upon the crown of the head, I have driven out every one (Griffith, 1895–1896; Bloomfield, 1897).

शर्म यच्छत्वोषधिः सह देवीररुन्धती ।

करत् पयस्वन्तं गोष्ठमयक्ष्मां उत पूरुषान् ॥

śarma yacchatvoṣadhiḥ
saha devīrarundhatī |
karat payasvantaṃ goṣṭham
ayakṣmāṃ uta pūruṣān ॥

(AV 6–59–2)

Let the *ōṣadhi Arundhatī* allied with Gods give us defending aid; avert *Yakṣma* (consumption) from our men and make our cow-pen rich in milk (Griffith, 1895–1896; Bloomfield, 1897).

After bringing the medicinal plants, the *yakṣma* disease is getting terrified. The disease is able to fly and scatter as though a lion's roar or fire dismayed them. The digestive fire (*vaiśvānarāgni*) in the stomach displaying with drugs is devastating the human beings disease.

In the AV 8th *kāṇḍa*, 7th *sūkta*, there are 28 verses/hymns which explain the characteristics of twenty one (21) medicinal herbs and trees that are revealed for the treatment of *yakṣma* and related diseases.

3.3 *Kuṣṭa, Kilasa, Palita, Vitiligo* (leprosy and allied skin disorders)

The word *kuṣṭa* is derived from the Sanskrit grammatical root word (*dhātu*)–*kuś*+*kathan*, '*kuṣṇāti rōgaṃ dēham vā*' meaning 'the disease leprosy torturing the body'. The term *kuṣṭa* is revealed in the *Atharvaveda saṃhitā*. It is described in the *kāṇḍa* 1, *sūktas* 23 and 24, with 1–4 hymns in each *sūkta*. Like other ancient medical texts in other parts of the world, the term *kuṣṭa* was probably used to represent a number of skin ailments along with leprosy (*Mycobacterium leprae*) of the modern sense. Three words '*śvitra*', '*kilasa*', and '*kuṣṭa*' were used for it. *Kilasa* is the name of 'white leprosy' in the *Atharvaveda* (1–23–1). It resulted in the appearance of grey (*palita*) and white (*śukla*, *śveta*) spots all over the body. The etiology of *kuṣṭa* is stated in the AV 1–23–4. It affects the bone tissue (*asthi*), muscle tissue (*māmsa*), adipose tissue (*mēda*) etc., and the essential elements that constitute the human body (*dhātus*).

नक्तंजातास्योषधे रामे कृष्णे असिक्रि च ।

इदं रजनि रजय किलासं पलितं च यत् ॥

naktaṃjātāsyoṣadhe
rāme kṛṣṇe asikni ca |
idaṃ rajani rajaya kilāsaṃ
palitaṃ ca yat ॥

(AV 1–23–1)



Oh oṣadhis! You are all born in the night. Remove the scales on the infected organ/skin and apply it with your color. Similarly, smear the bleached hair with your color. So, *rajani*, re-colour thou these ashy spots, this leprosy (Griffith, 1895–1896; Bloomfield, 1897).

Here in the above *mantra*/liturgy, the medicinal herbs namely, *rāma* (*vākucī*–*Psoralea corylifolia*), *kr̥ṣṇa* (*bhr̥ṅgarāja*–*Eclipta alba*), *asikni* (*Nīli*–*Indigofera tinctoria*) and *rajani* (*haridra*–*Curcuma longa*) are revealed in the *AV* for the treatment of *kilasa* and *palita* skin disorders.

अस्थिजस्य किलासस्य तनूजस्य च यत् त्वचि।

दूष्या कृतस्य ब्रह्मणा लक्ष्म श्वेतमनीनशम्॥

*asthijasya kilāsasya
tanūjasya ca yat tvaci |
dūṣyā kṛtasya brahmaṇā
lakṣma śvetamanīnaśam ||*

(*AV* 1–23–4)

The disease *kilasa* (leprosy) infection, on the skin, sprung from the body and from the bones. It is destroyed with the invocation of the *mantra*/liturgy (Griffith, 1895–1896; Bloomfield, 1897).

The plant *nīli* (*Indigofera tinctoria*) is described in two hymns of the *Atharvaveda* as a dark coloured plant (*AV* 1–23 and 1–24). This plant is used against white leprosy or *svētakuṣṭa*. It is believed that in the *Atharvaveda* the darkness of the plant *nīli* removes the white spot of the body. In these hymns white leprosy is called as *kilasa* and gray spots are called *palita*. For warding off this disease, the medicinal herbs *haridra*, *rāma*, *kr̥ṣṇa* are used along with plant *nīli* or *asikni*. A paste prepared from these plants or their leaves would give black colour to the skin (*AV* 1–23.1–3). *Kauṣika saṃhitā* describes detail use of the *nīli* plant in 26.22–24. Other plants *nakthajata* (*AV* 1–23–1), *asurī* or *śyāma* and *brahma* (*AV* 1–24–4) are also mentioned as the medicine for leprosy (*kuṣṭa roga*).

3.4 Classification of *kuṣṭa roga* in Ayurveda

The classification of *kuṣṭa* into seven types in the *Caraka saṃhitā* and 18 (seven *mahākuṣṭa* and 11 *kṣudrakuṣṭa*) in the *Suśruta saṃhitā* represents the astute observation of the ancient Indian physicians. Interestingly, *kuṣṭa* and *kilasa* (be it leprosy or vitiligo) was clearly declared not to be an inheritable disorder (Mukhopadhyay, 2016). The description of various forms shows that these included diseases like Ichthyosis, Dermatophytosis, Leucoderma, Psoriasis, Eczema, Seborrhoeic Dermatitis etc. (Banerjee, 1976). Vitiligo is a pigmentation disorder, in which pigmentation cells (melanocytes) of skin are destroyed, which results in smooth, white patches in the midst of normally pigmented skin. People with

vitiligo may also associate with eye and other diseases. Ayurveda has considered all the skin diseases under a common head known as *kuṣṭharoga*. The term *kuṣṭa*, in English known as leprosy, literally means discoloration, disgrace, disfiguration of the normal skin texture. Amarasimhakavi (1951) in his *Amarakośa*, the lexicographical work, defines the term *kuṣṭa* as following:

व्याधिः कुष्ठं पारिभाष्यं व्याप्यं पाकलमुत्पलं ।

शम्बिनी चोरपुष्पी स्यात्केशिन्यथ वितुन्नकः ॥

*vyādhiḥ kuṣṭham pāribhāvyam
vyāpyam pākalamutpalam |
śamkhinī corapuṣpī
syātkeśinyatha vitunnakah ||*

The herb, *Saussurea costus* (Falc.) Lipsch., (commonly called as *kuṣṭa*), is described in the *kāṇḍa* 5, *sūkta* 4, with 1–10 hymns; and in the *kāṇḍa* 19, *sūkta* 39 with 1–10 hymns. It is used in Ayurveda for the treatment of several skin disorders and also for other ailments of the body. Sharma (1969) has compiled its uses as mentioned in *Atharvaveda*. It has been used in *takman* (fever of all kind); *śiraḥ sool ukta jvara* (headache with fever); *tr̥tyāya jvara* (fever after every third day); *santatajvara* (long fever); *ekahik-jvara* (single fever); *kaḥa-roga* (cough); *krimi-roga* (worm remover); *śiroroga* (headache); *śirovedanā* (head pain); *dr̥ṣṭi-roga* (eyesight disease); *tvagroga* (skin diseases); *prāna-vāyu triguṇata* (breathing disease); *vyān-vāyu viguṇata* (a kind of breathing trouble). Apart from the above, it was also used as *bala-vardhaka* (tonic); *vīryavardhaka* (increaser of semen) and in jaundice. And, it was also used as incense and in *havana sāmigri* with other aromatic ingredients. The geographical distribution, botanical history, chemical constituents and therapeutic uses of the medicinal herb, *kuṣṭa*, which is an ancient and important medicinal plant native to Kashmir revealed in the *Atharvaveda* (*AV*) have been extensively discussed (Akbar, 2020; Prasad & Subhaktha, 2002; Rathore et al., 2021; Shah, 2019; Singh & Singh, 2019).

3.5 Śvitra

The word *śvitra* is derived from the Sanskrit grammatical root word (*dhātu*) – *śvit* + *rak*, *śvitatē śuklō bhavati*– which means white patch; *śvētakuṣṭhamu* (white leprosy). *Śvitra* is found as an adjective in the *Pāñcaviṃśa Brāhmaṇa* (12–11–11) in the sense of 'afflicted with white leprosy'. So *śvitra* is a disease where white patches appear on the body. The disease has got a special importance as it causes ugliness of the body. Probably keeping this in mind, the Ayurveda described the disease along with *kuṣṭa*. The important classical texts of Ayurveda such as *Caraka saṃhitā*, *Suśruta saṃhitā*, *Aṣṭāṅga hṛdaya* etc. clearly mention the treatment of *śvitra* along with its classification and prognosis. Most





Fig. 2 *Apāmārga* (*Achyranthes aspera* L.) **a** herbs in flowering **b** inflorescence close-up, **c** excised root pieces, **d** seeds

of them use *śvitra* and *kilasa* as synonyms. *Śvitra* is known by different names like (i) *kilasa* or *kilasam* where normal colour of skin is destroyed (*Atharvaveda*), (ii) *palitam* referring particularly to whiteness of the scalp hair (*Atharvaveda*), (iii) *alasa* (*Aitareya Brāhmaṇa* 6–33–5), (iv) *dāruna*, *caruna*, *śvitra* (*Caraka saṃhitā* 7–173) and (v) *kilasi* (meaning spotted deer) Max Muller’s commentary on *Ṛgveda*.

In *Atharvaveda*, four important medicinal plants have been mentioned for the treatment of *śvitra* (*kilasa*) in the two hymns of *AV* by their descriptive epithets. They are: *rāma* (*bākuṭī*—*Psoralea corylifolia*), *kṛṣṇa* (*bhṛīṅgarāja*—*Eclipta alba*), *asikni* (*Nīlī* - *Indigofera tinctoria*), *indravaruṇi* (*Citrullus colocynthis*) and *rajani* (*haridra*—*Curcuma longa*). The botanical descriptions of these medicinal plants are detailed in the section, ‘description of medicinal herbs’.

4 Descriptions of medicinal herbs

Several Indian origin medicinal plants that are revealed in the *Atharvaveda* are still being used as major ingredients of various Ayurvedic products. In this research article, some of

the medicinal herbs used for the treatment of skin diseases with their common names in Sanskrit, botanical description and chemical constituents are described below:

4.1 *Achyranthes aspera* Linnaeus (Family: *Amaranthaceae*; Sanskrit names: *apāmārga*, *adhoghanta*, *adhvaśalya*, *aghamārgava*, *aghāta*, *apāṅgaka*, *camatkāra*, *dhamārgava*)

It is an erect or procumbent, annual or perennial herb with spreading branches, usually up to 1 m tall, often with a herbaceous woody base. The stem is stiff, quadrangular, ribbed, pubescent, branched from the base, often reddish purplish tinged; leaves opposite, thick, ovate elliptic or obovate rounded, 4–12 cm long and up to 8 cm wide, velvety tomentose. The flowers are greenish-white, small, numerous, in axillary or terminal spikes up to 75 cm long, fruit utricle, oblong-cylindric, truncate at apex, rounded at base and seeds are reddish-brown, sub-cylindrical (Fig. 2a–d). The chemical constituents of *Achyranthes aspera* contain triterpenoid saponins which possess oleanolic acid as the aglycone. Ecdysterone, an insect moulting hormone, and long chain





Fig. 3 *Indravaruṇi* [*Citrullus colocynthis* (L.) Schrad.] **a** desert vine crop, **b** flower close-up, **c** spherical fruits, **d** seeds

alcohols are also found in this herb (Indian Herbal Pharmacopia, Vol. II, p. 5).

4.2 *Citrullus colocynthis* (L.) Schrad. (Family: Cucurbitaceae; Sanskrit names: *aindrī*, *atmarakṣa*, *bṛhadvaruṇi*, *bṛhatphala*, *ciṭrāla*, *ciṭrapāla*, *gavākṣi*, *indravaruṇi*, *mṛgabojani*, *mahēndravaruṇi*)

Citrullus colocynthis is a desert viny plant that grows in sandy, arid soils. Roots are large, fleshy, and perennial, leading to a high survival rate. Vine-like stems spread in all directions. Leaves are palmate and angular with three to seven divided lobes. Flowers are yellow and solitary in the axes of leaves and are borne by yellow-greenish peduncles. Corolla five-lobed, sub-campanulate; male and female flowers are separate; stamens five; ovary three-carpeled, each carpel bears six seeds. Fruit is smooth, spherical 5–10-cm-diameter, extremely bitter taste, each plant produces 15 to 30 fruits. Seeds are grey and 5 × 3 mm wide (Fig. 3a–d). The oil content of *Citrullus* seeds is consisting

of 67–73% linoleic acid, 10–16% oleic acid, 5–8% stearic acid, 9–12% palmitic acid and 3% cucurbitacin. In addition, the seeds contain a high amount of arginine, tryptophan, and the sulfur-containing amino acids.

4.3 *Clitoria ternatea* L. (Family: Fabaceae/ Leguminosae; Sanskrit names: *aparājita*, *adrikārṇi*, *asphoṭa*, *ghṛstih*, *girikarṇi*, *mahāṣveta*, *rādhā*, *śankhapuṣpi*, *śveta*)

It is a perennial herbaceous climbing plant, glabrescent and slender twiners. Leaves are elliptic, obtuse and flowers vivid deep blue/white/violet/pink, solitary; upside down, keel petal appears on the top rather than the underside. Pods compressed, entire, oblong, pubescent, 5–9 cm (2.0–2.8 in) long, flat pods, edible when tender; seeds six to ten in each pod (Fig. 4a–d). Chemical compounds isolated from *Clitoria ternatea* include various triterpenoids, flavonol glycosides, anthocyanins and steroids. Cyclic peptides known as cliotides have been isolated from the heat-stable fraction of the extract. The blue colour of *C. ternatea* is a result





Fig. 4 *Aparājita* (*Clitoria ternatea* L.) **a** climbing herb, **b** flower close-up, **c** pods with seeds, **d** dried seeds

of various anthocyanins, most importantly ternatins—polyacylated derivatives of delphinidin 3,3', 5'-triglucoside (Da-T) (Nguyen et al., 2011).

4.4 *Curcuma longa* L. (Family: Zingiberaceae; Sanskrit names: *haridra*, *rajani*, *niṣāhaldi*, *halada*)

Turmeric is a perennial herbaceous plant reaching up to 1 m (3'3") tall; rhizomes highly branched, yellow to orange, cylindrical, aromatic. Leaves are alternate and arranged in two rows, with leaf sheath, petiole 50–115 cm (20"–45") long, leaf blade 76–115 cm (30"–45") long, oblong to

elliptical. Flowers are hermaphrodite; sepals three; petals three, bright yellow, fused into corolla tube. Fruit capsule opens with three compartments (Fig. 5a–d). Phytochemical constituents of turmeric include diarylheptanoids, a class including numerous curcuminoids, such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin. Curcumin constitutes up to 3.14% of assayed commercial samples of turmeric powder (the average was 1.51%); curry powder contains much less (an average of 0.29%). About 34 essential oils are present in turmeric, among which turmerone, germacrone, atlantone, and zingiberene are major constituents (Nelson et al., 2017). Turmeric is a plant known by its medicinal use from the Vedic period, and is widely used in





Fig. 5 *Rajani* (*Curcuma longa* L.) **a** crop, **b** flowering, **c** rhizomes, **d** Haldi powder

herbal and complementary medicine. In a recent research report on the current knowledge on Curcumin's effects on skin conditions alongside with its bioavailability and safety profile is documented (Vollono et al., 2019).

4.5 *Eclipta alba* (L.) Hassk. (Family: Asteraceae/Compositae; Sanskrit names: *bhṛṅga*, *bhṛṅgarāja*, *kesarāja*, *kayyonni*, *mārkava*, *tekarajah*)

The plant is a creeping and ascending herb; stem cylindrical or flat, rough due to appressed white hairs; leaves are opposite, sessile to sub-sessile, wide, oblong, lanceolate, sub-entire, acute to sub-acute and strigose with appressed hairs on both surfaces. Flowers are white, solitary ovate, obtuse or acute and strigose with oppressed hairs; stamens five, filament epipetalous, free, anther united into a tube with

base obtuse. Ovary is inferior and unilocular with one basal ovule. Fruit is achenial cypsela, one seeded, cuneate, with a narrow wing and brown in colour (Fig. 6a–d). The chemical constituents of *Eclipta alba* contain various phytochemicals, such as coumestans, polypeptides, polyacetylenes, thiophene derivatives, steroids, sterols, triterpenes, and flavonoids (Chung et al., 2017).

4.6 *Indigofera tinctoria* L. (Family: Fabaceae/Leguminosae; Sanskrit names: *anjanakesika*, *asita*, *aśikni*, *kāli*, *kāla*, *kālakesi*, *nīlī*, *nīlika*, *nīlini*, *ranjani*, *rangapatri* and *śyama*)

Indigofera tinctoria is an erect shrub, 1.5 m tall, many-branched from base, appressed-pubescent under shrubs. Leaf rachis are around 8 cm long and leaf-lets around 7–11 cm,





Fig. 6 *Bhṛngarāja* [*Eclipta alba* (L.) Hassk.] **a** plant, **b** flower close-up, **c** drying seeds, **d** *Bhṛngarāja* powder

opposite, rarely sub-opposite, obovate-oblong, obtuse, apiculate. Raceme ~4 cm long, 15–20-flowered; calyx incised to half-way; pod linear, slightly curved, sparsely hairy, deflexed, 6–10-seeded, 2–3 cm long (Fig. 7a–d). Dye is obtained from the processing of the plant's leaves. They are soaked in water and fermented in order to convert the glycoside indican naturally present in the plant to the blue dye *indigotin*. The precipitate from the fermented leaf solution is mixed with a strong base such as lye. The chemical constituents extracted from this plant are rotenoids deguelin, dehydrodeguelin, rotenol, rotenone, tephrosin and sumatrol (Perkin & Bloxam, 1907).

4.7 *Psoralea corylifolia* L. (Family: Fabaceae/ Leguminosae; Sanskrit names: *bākuci*, *vākuci*, *āvalguja*, *kṛṣṇaphala*, *pootiphali*, *kuṣṭāgni*, *somarājñī*, *suparnika*, *somavalli*, *kālameṣi*)

It is an annual, 50–90 cm tall plant. Leaves simple, ovate, sub-cordate at base, petiole 2.5 cm long, dentate, pubescent on both surfaces; raceme 5.5 cm long-peduncled; flowers 12–20, bluish-purple; pod ovoid or oblong, one-seeded. The most distinctive feature is the occurrence of minute brown glands which are immersed in surface tissue on all parts of the plant, giving it a distinctive and pleasant fragrance





Fig. 7 *Nīlī* (*Indigofera tinctoria* L.) **a** shrub, **b** flowers close-up, **c** drying pods, **d** indigo powder

(Fig. 8a–d). The chemical constituents of *Psoralea corylifolia* extract contain numerous phytochemicals, including flavonoids (neobavaisoflavone, isobavachalcone, bavachalcone, bavachinin, bavachin, corylin, corylifol, corylifolin and 6-prenylnaringenin), coumarins (psoralidin, psoralen, isopsoralen and angelicin), meroterpenes (bakuchiol, and 3-hydroxybakuchiol) (Zhao et al., 2005).

4.8 *Saussurea costus* (Falc.) Lipsch. (Family: Asteraceae/Compositae; Sanskrit names: kuṣṭa, dravyaguna vijñāna, nadhāriṣa, naghāmāra and viśvabheṣaja)

Saussurea costus is 1–2 m height plant. Leaves with cauline, small, pubescent, irregularly toothed while radical leaves are very large, triangular with the long-winged petiole. Roots are often 50–60 cm long and 15–30 cm thick with a camphoraceous aromatic smell. Roots are cut into small pieces and dried indirectly over the slow and indirect fire and to

form the crude drug *kuth* of the market (Fig. 9a–d). In the field, *Arctium lappa* (Burdock) is often mistaken for *Saussurea lappa* due to its large leaves. It is headed with dark bluish with bluish-purple flowers, achene compressed, curved upwards, pappus-hairs brown. Most pharmacologically active substances present in roots of *kuṣṭa* are sesquiterpenes and sesquiterpene lactones; other compounds include glycosides, anthraquinones, chlorogenic acid, β -costic acid, daucosterol, β -sitosterol, and saussureamines A to E.

4.9 *Sida cordifolia* L. (Family: Malvaceae; Sanskrit names: arundhati, badiyalaka, bāla, baladaya)

Sida cordifolia is an erect perennial that reaches 50–200 cm (20"–79") tall, with the entire plant covered with soft white felt-like hair. Stems are yellow-green, hairy, long, and slender; leaves oblong-ovate, covered with hairs, and 3.5–7.5 cm (1.4"–3.0") long by 2.5–6 cm (0.98"–2.36") wide. Flowers





Fig. 8 *Bākūcī* (*Psoralea corylifolia* L.) **a** plants, **b** flowering in clusters, **c** drying seeds, **d** seeds

are dark yellow, sometimes with a darker orange center; calyx hairy 5-lobed; corolla yellow, 5-lobed. Fruits are 6–8 mm wide, split into 9–11 mericarps (one-seeded portions) when mature; seeds ~2 mm across, dark brown or black, smooth (Fig. 10a–d). Phyto-constituents such as alcaloids, β -phenethylamine, ephedrine, pseudoephedrine, S-(+)-*N*₆-methyltryptophan methyl ester, hypaphorine, vasicinone, vasicinol, choline, and betaine. The roots and stems contain the alkaloid ephedrine. Also, two flavanones and two phytosterols have been isolated from this plant (Ghosal et al., 1975).

5 Conclusions

The study of Vedic, Ayurvedic texts and ancient treatises concerning medical world reveals that the skin diseases are prevailing from Vedic period. The social awkwardness due to these diseases and their therapeutic aspects are mentioned in these treatises. Among the four Vedas, the *Atharvaveda*

provides more information related to the various diseases prevalent during that period. The mention of leprosy and other skin diseases (1–23:1–4 and 1–24:1–4), disease of the nail (2–33–6), jaundice (1–22–1, 1–22–4) and many other verses dealing with wound healing etc. (4–12–4, 6–57–1) are also noteworthy. The impact of Ayurveda on the then Indian Society and intermingling of ideas between medical and other social or religious sciences can be ascertained from such descriptions. In the doctrines of Ayurveda, the *twak rogas* are known by the general term *kuṣṭa*. *Atharvaveda* describes the *twak rogas* in the name of *kilasa*, *palita*, having grey and white spots, generally from deeper layers of skin and referred their herbal remedies. Almost all the Ayurvedic *saṃhitās* uniformly classified *kuṣṭa* (leprosy) as *mahakuṣṭa* and *kṣudrakuṣṭa*, but there is difference of opinion about number in each group. In *Atharvaveda*, there are special hymns dedicated to the praise of herbs like *jaṅgīḍa* (*Oroxylum indicum* Vent), *kuṣṭa* (*Saussurea lappa* C.B. Clarke), *rohinī* (*Ficus infectoria*), *apāmārga* (*Achyranthes aspera* Linn.) and others. It is observed that the *Atharvaveda*





Fig. 9 *Kuṣṭha* [*Saussurea costus* (Falc.) Lipsch.] **a** plant, **b** flowers in clusters, **c** drying seeds, **d** Sliced root pieces

recommends one medicinal herb to be used with charm for one disease. Using the knowledge from *Atharvaveda*, the later ayurvedic *saṃhitās* adopted using combination of herbs for the treatment of skin diseases. The examples of such treatments, are the usage of black seeds like *vākuṭī* (*Psoralea corylifolia*) together with *bhr̥ṅgarāja* (*Eclipta alba*), *indravaruṇi* (*Citrullus colocynthis*) and *rajani* (*Curcuma longa*) are recommended for the cure of *śvitra roga*. Four plants are recommended for the treatment of *kilasa* and *palita* skin disorders in the two hymns of *Atharvaveda* by their descriptive epithets— *rāma* (dark, *Psoralea corylifolia*), *kṛṣṇa* (black or stable, *Eclipta alba*), *asikni* (dusky, *Indigofera tinctoria*) and *rajani* (yellow, *Curcuma longa*).

The therapeutic herbs have great potential to cure different kinds of skin diseases. Almost 80% of people in India depend on traditional health care and use different plant based products for curing skin related problems. Compared with the conventional allopathic drugs, they have relatively low cost and can be of great benefit to the population of

India in general and poor people in particular. Herbs are a rich source of active ingredients and can be safer and cost effective treatment for skin diseases ranging from rashes to the dreadful skin cancer. An increasing amount of evidence suggests that Curcumin (*Curcuma longa* L.) may represent an effective agent in the treatment of several skin disorders. The possible use of Curcumin in combination with traditional drugs and the formulations of novel delivery systems represent a very promising field for future applicative research.

The conservation of these plants as revealed in the Vedas with the help of local participation and carrying out of extensive research to broaden the prospects of herbal drugs in various diseases treatment is the need of the hour. ‘*Śataṃ hyasya bhīṣajāḥ sahasramūta vīrudhaḥ*’ || – The AV 2–9–3 speaks about a patient as, ‘He has attained attainments. He has achieved the strong hold of the living. For he now has a hundred physicians are his and also a thousand plants’.



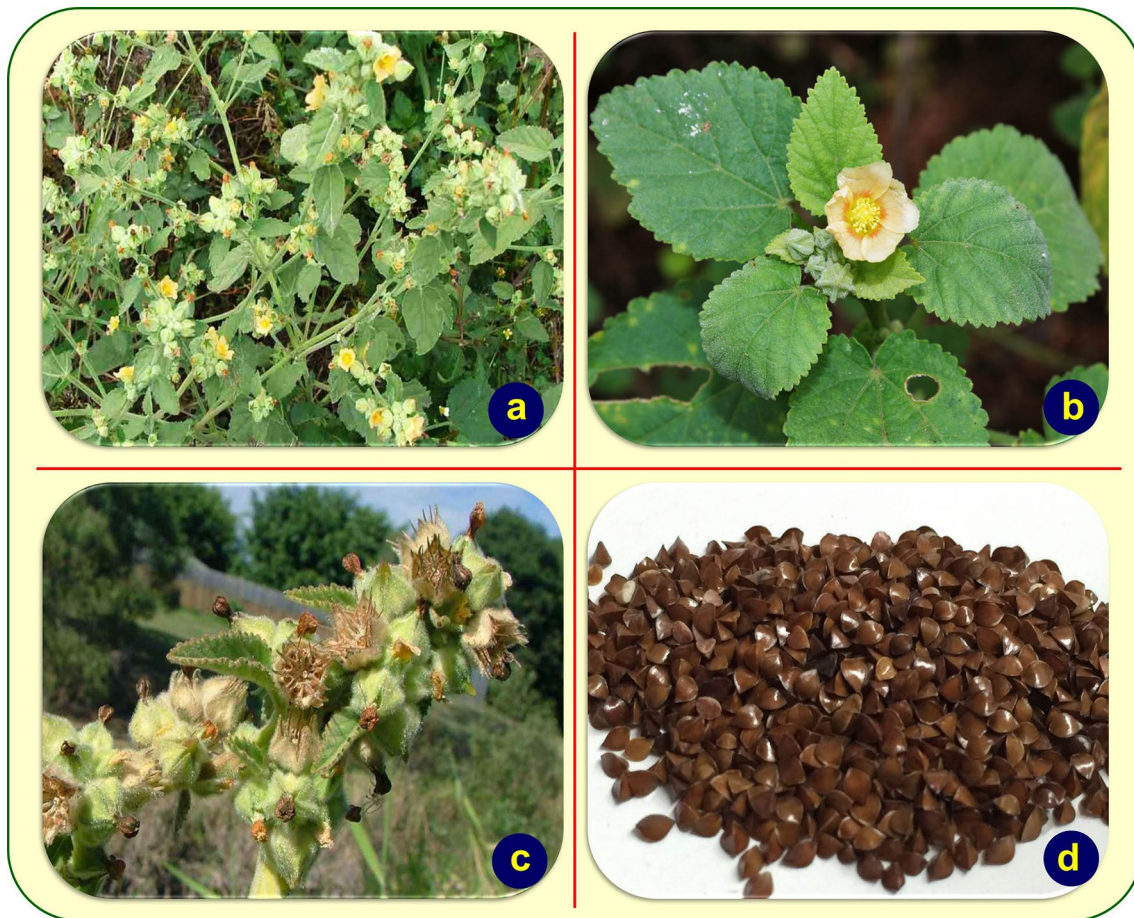


Fig. 10 *Arundhati* (*Sida cordifolia* L.) **a** entire plant, **b** flowering stage, **c** drying fruits, **d** seeds

Acknowledgements I profusely thank Brahmasri Vedam Venkata Rama Sastry for his continued guidance and encouragement. I am grateful to the Indian National Commission for History of Science, the Indian National Science Academy (INSA), New Delhi, for financing the project titled, 'Plants of *Atharvaveda*– Their Descriptions and Medicinal Uses'. The present article is the extension of the research investigation of the above-mentioned research project. I wish to acknowledge the Cauvery Sannidhi for Indian Culture, Srirangapatna, Mysore, for accepting to be the host institute for this project.

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