

KRIMIRŌGA: A MEDICO-HISTORICAL STUDY

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ABSTRACT

Krimirōga is a common manifestation in the tropical region. More than half of the population is supposed to be suffering from this ailment. The term *Krimi* or *Kṛmi* is known from Vedic era in India. Several references are available in the Vedic and Ayurvedic literature regarding the nomenclature, etiology and treatment of this disease. The history of modern Helminthology began with 'Ebers Papyrus' (1550 B.C.).

The word *Krimi* is derived from the word '*Krama*' *dhātu* (verb) + '*ini*' *Pratyaya* (suffix). According to *Vācaspatyam* *Krimi* means *Kṣudrajantu* (small living entity), the worms which creep and jump and the insects those fly. *Krimi*, may be interpreted for both pathogenic or non-pathogenic organisms i.e. virus, bacteria or parasites according to modern medical science.

Ācārya Caraka explained *Krimirōga* based on *Hētvādisaptakaḡaṇa* (seven specific aspects). The detailed scientific description of *Krimirōga* is given in *Vimānasthāna* of *Carakasāmhita*, it is an ideal example to explain the research methodology for the diagnosing diseases. The main line of treatment for *Krimirōga* is explained under three principles *Apakarṣaṇa* (extraction) as *Sāmsōdhana* (elimination therapy), *Prakṛtivyāghāta* (annihilation of pathology) as *Sāmsamana* (alleviation therapy) and *Nidānavarjana* (avoidance of causative factors). This article contains the comprehensive literature of *Krimirōga*, compiled from *Atharvavēda* and *Brhatṛayī* (*Carakasāmhita*, *Suśrutasāmhita*, *Aṣṭāṅgasāṅgraha* and *Aṣṭāṅgahṛdaya*).

Introduction:

Krimirōga is a common manifestation in the tropical regions. More than half of the population is supposed to be suffering from this ailment. The term *Kṛmi* or *Krimi* is known from the Vedic era in India. Several references are available in the Vedic literature regarding the nomenclature, etiology and treatment of this disease.

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Etymology

The word *Krimi* is derived from 'Kramā' dhātu (verb) and 'Inī' Pratyaya (suffix).¹ According to *Vācaspatyam* *Krimi* means *Kṣudrajantu* (small living entity). In *Atharvavēda* *Krimi* or *Kṛmi* refers to worms which creep and jump or insects those fly. (*Atharva. 5/23/3*) *Krimi*, may be interpreted for both pathogenic and non-pathogenic organisms i.e. virus, bacteria or parasites according to modern medical science. The synonyms mentioned for *Krimi* in Vedic literature are *Kikāsa*, *Kināśa*, *Kimidāna* etc.

Vedic literature

The fact that certain diseases were due to the presence of visible *Krimi* (Parasites) and invisible *Krimi* (germs or microorganisms) inside the body were known in Ancient India from very remote ages. The Veda, apart from being the divine revelations and the treasure of knowledge, include information regarding the technological and Medical developments of that period. There are ample references about organisms which may be regarded as microbes, parasites and viruses of today.

References of *Krimirōga* are mainly found in four chapters of *Atharvavēda* i.e. 2/31/1-5; 2/32/1-6; 4/37/1-12 and 5/23/1-13. There is ample of description about morphology, pathogenesis and treatment of *Krimi* in *Atharvavēda*.

Morphology of *Krimi*

The word *Kṛmi* or *Krimi* has got a wide connotation in Vedic literature comprising of all pathogenic organisms. *Krimi* is described in several aspects, such as size, shape, colour, location, passage, mode of infection etc. in *Atharvavēda*. *Krimi* were classified into two groups, *Dṛṣṭa* (macroscopic) and *Adṛṣṭa* (microscopic). *Krimi* having very small size are described as *Kṣullaka* (minute), which was commented by *Śāyaṇācārya*, the commentator of Veda as 'Bṛjāvasthāḥ Sūkṣmarūpāḥ Durlakṣyāḥ Krimayaḥ' (*Krimi* are germinal, minute and hardly visible). According to their shape, they were described as *Viśvarūpa* (having various shapes). *Krimi* named *Alagaṇḍu* having shape of *Gaṇḍupada* (described in *Sarṁhitā-grantha*), is known as round worm in these days. *Krimi* named *Kururu* can be seen in bundles, which may be considered as thread worm. The worms have different colours like white, brown, red, black and mixed. They are assumed to have *Śṛṅga* (horns), *Kuśumbha* (poison-sac), head, back, mouth and sexual organs. The *Krimi* called *Caturakṣa* is said to be having four eyes. The *Krimi* named *Triśīrṣa* supposed to be having three head and *Trikakuda* assumed to be having three suckers. *Krimi* having hooks and suckers can be called as hook worms. There is mentioning of head and mouth of *Krimi* in *Atharvavēda-*

Bhinadmyaśmanā śirō dahāmyagninā mukham (Atharva. 5/23/13)

Sex discrimination (male and female) of worms is said in *Atharvavēda* as-

Sarvēśām ca krimīṇām sarvāsām ca krimīṇām (Atharva. 5/23/13)

They invade the body through the injured skin or through food and drinks. They may be situated in different organs like eyes, nose, teeth, head, intestines or back. They may have *Vēśa* (main seat of infection) and *Parivēśa* (secondary centers of infection) in the body. Growth and development of worms was known by their relation (king, mother, brother and sister) as mentioned in this hymn-

Hatō rājā krimīṇāmutaiśām sthapatīrhataḥ

Hatō hatamātā krimīrhatabhrātā hatasvasā (Atharva. 5/23/11)

The following hymn refers to worms in children-

Kumārasya krimīn dhanapatē jahi (Atharva. 5/23/2)

The other names of *Krimi* mentioned in *Atharvaveda* were *Yēvāśa*, *Kaṣkaṣa*, *Ējatka*, *Śipivītuka* etc. (*Atharva. 5/23/7*)

Pathogenesis

Krimi invades into various parts of human body such as intestine, brain, flanks, eyes, nose, teeth etc. and cause diseases. It is quoted by *Atharvan* as follows.

Aṇvāntryam śirṣanyamathō pārṣṭēyam krimīn

Avaskavam vyadhvaram krimīn vacasā jambhayāmasi

(Atharva. 2/31/4)

Yō akṣyau parisarpati yō nāsē parisarpati

Datām yō madhyam gacchati tam krimīn jambhayāmasi

(Atharva. 5/32/3)

Treatment

There is not only *Daivavyapāśraya Cikitsā* (chanting of hymns with specific procedure) in some Vedic hymns of *Atharvavēda* but also some drugs were mentioned for treating *Krimirōga*, which may be considered as *Yuktivyapāśraya Cikitsā* (treatment based on logic and skill) by *Rṣi Kaśyapa*, *Kaṇva*, *Agastya*, *Jamadagni* and *Atri*. This is evident by the following *Mantra* of *Atharvavēda*.

Tvayā pūrvamatharvāṇō jaghnū rakṣyāmsyōśadhē

Tvayā jaghāna kaśyapastvayā kaṇvō agastyah (Atharva. 4/37/1)

Atrivad vaḥ krimayō hanmi kaṇvavajjamadagnivat

Agastyasya brahmaṇā sam pināmyaham krimīn (Atharva. 5/33/10)

The following hymn reveals that the microscopic and macroscopic organisms were killed by Sunlight.

Ut purastāt sūrya ēti viśvadṛṣṭō adṛṣṭahā
Dṛṣṭāmśca ghnannadrṣṭāmśca sarvāmśca pramṛṇan krimīn
 (Atharva. 5/23/6)
Udyannādītyaḥ krimīn hantu nimrōcan hantu raśmibhiḥ
Yē antaḥ krimayō gavi (Atharva. 2/32/1)

It is stated that the king of the worms should be destroyed. It is also mentioned that the worms should be destroyed by crushing their heads with a stone and burning their faces with fire. (Atharva. 5/23/11,13)

Apart from the slaying/destruction of *Krimi*, *Atharvaṇa* alluded certain drugs for the treatment of *Krimi* viz. *Ajaśṛṅgī*, *Rātakī*, *Tikṣṇaśṛṅgī*, *Galgālū*, *Pilā*, *Naladī*, *Aukṣagandhi*, *Pramandanī* etc. There is mentioning of some trees i.e. *Aśvattha*, *Nyagrōdha*, *Mahāvṛkṣa*, *Śikhaṇḍī*, *Harita Arjuna* having the quality that with their mere existence, they can protect from the afflictions of *Krimi*. (Atharva. 4/37/1-12)

Kauśikasūtra mentioned *Krimi* in human beings and also in animals like horse, goat, elephant etc. (*Kau. Sū. 32/26-27 Kau. Pa.*). People in those days have *Krimibhaya* i.e. they were afraid of *Krimi* (*Kau. Sū. 50/17,19*). They were panic about mosquitoes, scorpions, snakes etc. *Kauśikapaddhati* advised *śāntikarma* like chanting mantra, *yajña* etc. for the fear of *Krimi* (*Kau. Sū. 29/20-26*). The medicines for *Krimi* are cited as *Krimibhaiṣajya*. *Palāśa*, *Udumbara*, *Karīra*, *Śīgru*, *Uśīra* etc. are the some of the drugs advocated to *Krimi*. (*Kau. Sū. 27/20-28, 29/20-26 Kau. Pa.*)

Modern Historical background²

Humans are hosts to nearly 300 species of parasitic worms and over 70 species of protozoa, some derived from our primate ancestors and some acquired from the animals we have domesticated or come in contact with during our relatively short history on Earth. Our knowledge of parasitic infections extends into antiquity, and descriptions of parasites and parasitic infections are found in the earliest writings and have been confirmed by the finding of parasites in archaeological material. The first written records of parasitic infections come from Ebers papyrus of 1500 BC discovered at Thebes. Later, there were many detailed descriptions of various diseases that might or might not be caused by parasites, specifically fevers, in the writings of Greek physicians between 800 to 300 BC, such as the collected works of Hippocrates, known as the Corpus Hippocraticorum, and from physicians from other civilizations including China from 3000 to 300 BC, Rome from 700 BC to 400 AD, and the Arab Empire in the latter part of the first millennium. As time passed, the descriptions

of infections became more accurate and Arabic physicians, particularly Rhazes (AD 850 to 923) and Avicenna (AD 980 to 1037), wrote important medical works that contain a great deal of information about diseases clearly caused by parasites.

Ayurvedic literature

Ayurveda *samhitā* advocates a systematic approach for the management of *Krimirōga*. The vast description of *Krimi* with their classification, nomenclature, habitat, morphology, symptoms, principles of treatment and therapeutic formulations are found in Ayurvedic literature. The references of *Krimirōga* from *Bṛhatrayī* are as follows:

S. No. Name of the Ayurvedic treatise Reference

- | | | |
|----|------------------------|---|
| 1. | <i>Carakasamhitā</i> | <i>Vimānasthāna</i> 7th chapter |
| 2. | <i>Suśrutasaṁhitā</i> | <i>Uttaratantra</i> 54th chapter |
| 3. | <i>Aṣṭāṅgasaṅgraha</i> | <i>Nidānasthāna</i> 14th and <i>Cikitsāsthāna</i> 22th chapters |
| 4. | <i>Aṣṭāṅgahṛdaya</i> | <i>Nidānasthāna</i> 14th and <i>Cikitsāsthāna</i> 20th chapters |

Carakasamhitā described *Krimirōga* in an explicit manner under seven aspects, viz. *Samutthāna* (cause), *Sthāna* (habitat), *Samsthāna* (form), *Varṇa* (colour), *Nāma* (name), *Prabhāva* (effect) and *Cikitsā* (treatment). According to *Ācārya Caraka* there are two types of *Krimi*, *Sahaja* (non pathogenic) and *Rōgōtpādaka* (pathogenic), which are again classified into twenty in number. *Krimi* are classified into four types i.e. *Purīṣaja* (born of faeces), *Ślēṣmaja* (born of phlegm or mucous), *Śōṇitaja* (born of blood) and *Malaja* (born of external excreta) on the basis of their origin. (*Ca. Vi. 7/8-9*)

Suśrutasaṁhitā elaborately described *Krimi* with respect to their various shapes, locations, cause of diseases etc. It is also stated that *Krimi*, arising from *Kapha* (phlegm), *Purīṣa* (feces) and *Rakta* (blood) are located in *Āmāśaya* (stomach), *Pakvāśaya* (large intestine) and *Raktaja dhamanī* (blood vessels) respectively. (*Su. U. 54/6*)

Aṣṭāṅgasaṅgraha and *Aṣṭāṅgahṛdaya* described *Krimirōga* more or less same as in *Carakasamhitā* but in brief.

Classification of *Krimi*

According to *Ācārya Caraka*, *Krimi* are classified into two types viz.

1. *Sahaja* (non-pathogenic)
2. *Rōgōtpādaka* (pathogenic)

Sahaja Krimi are useful to our body and *Rōgōtpādaka Krimi* are harmful and these are classified into different types. Even the modern medical science also classifies these microorganisms as pathogenic and non-pathogenic organisms.

Rōgōtpādaka Krimi

According to *Vāgbhaṭa*, *Krimi* are classified into two types i.e.

1. *Bāhya* (External)
2. *Ābhyantara* (Internal)

Classification based on their origin

Bāhya Krimi are called *Malaja* or *Bāhyamalaja* or *Bahirmalaja* (External dirt-born) and *Ābhyantara Krimi* are classified into three groups i.e.

1. *Ślēsmaja* or *Kaphaja* (Phlegm or mucous-born)
2. *Śōṇitaja* or *Asṛjanma* (Blood-born)
3. *Purīṣaja* or *Viḍjanma* (Faeces-born)

Classification based on their Nomenclature

Nomenclature of *Rōgōtpādaka Krimi* according to *Carakasamhitā* (*Ca. Vi. 7/10-13*)

S. No.	<i>Ābhyantara</i>			<i>Malaja</i> (<i>Bāhyamalajāta</i>)
	<i>Purīṣaja</i>	<i>Ślēsmaja</i>	<i>Śōṇitaja</i>	
1.	<i>Kakēruka</i>	<i>Antrāda</i>	<i>Kēśāda</i>	<i>Yūkā</i>
2.	<i>Makēruka</i>	<i>Udarāda</i>	<i>Lōmāda</i>	<i>Pipīlikā</i>
3.	<i>Lēliha</i>	<i>Hṛdayacara</i>	<i>Lōmadvīpa</i>	
4.	<i>Saśūlaka</i>	<i>Curu</i>	<i>Saurasa</i>	
5.	<i>Sausurāda</i>	<i>Darbhapuṣpa</i>	<i>Auḍumbara</i>	
6.		<i>Saugandhika</i>	<i>Jantumāṭṭ</i>	
7.		<i>Mahāguda</i>		

Nomenclature of *Rōgōtpādaka Krimi* according to *Suśrutasaṁhitā* (*Su. U. 54/8,12,15*)

S. No.	<i>Viḍjanma</i>	<i>Kaphajanma</i>	<i>Raktaja</i>
1.	<i>Ajava</i>	<i>Darbhapuṣpa</i>	<i>Kēśāda</i>
2.	<i>Vijava</i>	<i>Mahāpuṣpa</i>	<i>Rōmāda</i>
3.	<i>Kīpya</i>	<i>Pralūna</i>	<i>Nakhāda</i>
4.	<i>Cīpya</i>	<i>Cīṭa</i>	<i>Dantāda</i>
5.	<i>Gaṇḍūpada</i>	<i>Pipīlikā</i>	<i>Kikkīśa</i>
6.	<i>Cūru</i>	<i>Dāruṇa</i>	<i>Kuṣṭhaja</i>
7.	<i>Dvimukha</i>		<i>Parīsarpa</i>

Nomenclature of *Rōgōtpādaka Krimi* according to *Aṣṭāṅgasaṅgraha* (A. Sam. Ni. 14/46,51,54,57)

S. No.	Bāhya	Ābhyantara		
		Purīṣaja	Ślēṣmaja	Śōṇitaja
1.	Yūkā	Kakēruka	Antrāda	Kēśāda
2.	Likṣā	Makēruka	Udarāvēṣṭa	Lōmavidhvamśa
3.		Sausurāda	Hṛdayāda	Lōmadvīpa
4.		Salūna	Mahāruha	Udumbara
5.		Lēliha	Curu	Aurasa
6.			Darbhakusuma	Māṭr
7.			Sugandha	

Nomenclature of *Rōgōtpādaka Krimi* according to *Aṣṭāṅgahṛdaya* (A. Hr. Ni. 14/44,49,52,55)

S. No.	Bāhya	Ābhyantara		
		Purīṣaja	Ślēṣmaja	Śōṇitaja
1.	Yūkā	Kakēruka	Antrāda	Kēśāda
2.	Likṣā	Makēruka	Udarāvēṣṭa	Lōmavidhvamśa
3.		Sausurāda	Hṛdayāda	Lōmadvīpa
4.		Sulūna	Mahākuha	Udumbara
5.		Lēliha	Kuru	Aurasa
6.			Darbhakusuma	Māṭr
7.			Sugandha	

Etiology

According to *Suśrutasaṁhitā*, *Krimi* arises due to indigestion, eating immediately after a meal (before the last meal is digested), unsuitable diet, incompatible and filthy food; lack of physical exercise, day-sleep; intake of heavy, too unctuous and too cold items, black gram, edibles of rice-flour, pulses, stem and root of lotus, *Kaśēruka* (*Scirpus grossus* Linn. f.), leafy vegetables, wine, vinegar, curd, milk, jaggery, sugarcane, paste of sesamum, meat of marshy animals, oil cake, flattened rice etc. and also sweet and sour drinks. (Su. Ci. 54/3-5)

Pathogenesis

Due to indulgence in above said etiological factors *Kapha* and *Pitta* get aggravated and gives rise to *Krimi* of various shapes and in various locations. Generally, those arising from *Kapha* are located in *Āmāsāya* and those arising from *Vīṭ* (faeces) are located in *Pakvāsāya* and while those arising from blood are found in blood vessels. (Su. Ci. 54/6-7)

Hētvādisaptakagaṇa (Seven specific aspects)

Krimirōga described in *Vimānasthāna* of *Carakasamhitā* is an ideal example to explain the research methodology of diseases. The details were explained in a principle method based on *Hētvādisaptakagaṇa* (Seven aspects of *Krimirōga*) i.e. *Samutthāna* (cause), *Sthāna* (origin & habitat), *Samsthāna* (form), *Varṇa* (colour), *Nāma* (nomenclature), *Prabhāva* (effect) and *Cikitsā* (treatment). The description of each type of *Krimi* is as follows. (*Ca. Vi. 7/8,31*)

1. Malaja (Bāhyamalaja or Bahirmalaja) (External dirt born)

Nomenclature	<i>Yūkā</i> and <i>Pipīlikā</i> . <i>Yūkā</i> and <i>Likṣā</i> .	(<i>Ca. Vi. 7/10</i>) (<i>A. Saṁ. Nī. 14/46</i>), (<i>A. Hṛ. Nī. 14/44</i>)
Morphology	Minute, multipede and having the shape of <i>Tīla</i> (<i>Sesamum indicum</i> Linn.).	(<i>Ca. Vi. 7/10</i>), (<i>A. Saṁ. Nī. 14/46</i>), (<i>A. Hṛ. Nī. 14/44</i>)
Colour	Black and white. Resemble <i>Tīla</i> (the seed of <i>Sesamum indicum</i> Linn.) in colour.	(<i>Ca. Vi. 7/10</i>) (<i>A. Saṁ. Nī. 14/46</i>), (<i>A. Hṛ. Nī. 14/44</i>)
Origin	<i>Bāhyamala</i> (External excreta).	(<i>Ca. Vi. 7/10</i>)
Habitat	Hair on the head, face and other parts of the body, eye lashes and clothes.	(<i>Ca. Vi. 7/10</i>), (<i>A. Saṁ. Nī. 14/46</i>), (<i>A. Hṛ. Nī. 14/44</i>)
Causes	Lack of cleanliness of the body	(<i>Ca. Vi. 7/10</i>), (<i>A. Saṁ. Nī. 14/45</i>), (<i>A. Hṛ. Nī. 14/43</i>)
Effects	<i>Kaṇḍū</i> (pruritis), <i>Kōṭha</i> (urticaria) and <i>Piḍakā</i> (eruptions). <i>Kōṭha</i> , <i>Piṭakā</i> or <i>Piṭikā</i> , <i>Kaṇḍū</i> and <i>Gaṇḍa</i> (enlargement of lymph glands or tumors).	(<i>Ca. Vi. 7/10</i>) (<i>A. Saṁ. Nī. 14/47</i>), (<i>A. Hṛ. Nī. 14/45</i>)
Treatment	<i>Apakarṣaṇa</i> (deworming), <i>Malōpaghāta</i> (keeping the body clean) & <i>Malakara-bhāvānupasēvana</i> (avoidance of excreta producing regimens).	(<i>Ca. Vi. 7/10</i>)

2. *Śōṇitaja Krimi* (Blood-born)

Type of <i>Krimi</i>	Non-visible (Microscopic).	(Ca. Vi. 7/11), (Su. U. 54/19) (A. Saṁ.Ni. 14/53), (A. Hṛ. Ni. 14/51)
Nomenclature	<i>Kēśāda</i> , <i>Lōmāda</i> , <i>Lōmadvīpa</i> , <i>Saurasa</i> , <i>Auḍumbara</i> and <i>Jantumāṭr</i> . <i>Kēśāda</i> , <i>Rōmāda</i> , <i>Nakhāda</i> , <i>Dantāda</i> , <i>Kikkīśa</i> , <i>Kuṣṭhaja</i> and <i>Parīsarpa</i> . <i>Kēśāda</i> , <i>Lōmavidhvamśa</i> , <i>Lōmadvīpa</i> , <i>Udumbara</i> , <i>Aurasa</i> and <i>Māṭr</i> .	(Ca. Vi. 7/11) (Su. U. 54/15) (A. Saṁ.Ni. 14/54), (A. Hṛ. Ni. 14/52)
Morphology	Minute, round and devoid of legs, not visible due to their microscopic nature. Glossy and big.	(Ca. Vi. 7/11), (A. Saṁ. Ni. 14/53), (A. Hṛ. Ni. 14/51) (Su. U. 54/16)
Colour	Copper.	(Ca. Vi. 7/11), (A. Saṁ. Ni. 14/53), (A. Hṛ. Ni. 14/51)
Habitat	Reddish and black. <i>Raktavāhinī dhamanī</i> or <i>sirā</i> (Blood-vessels).	(Su. U. 54/16) (Ca. Vi. 7/11), (Su. U. 54/6), (A. Saṁ. Ni. 14/53), (A. Hṛ. Ni. 14/51)
Causes	<i>Viruddhāśana</i> (intake of incompatible food), <i>Ajīrnāśana</i> (eating during indigestion), <i>Śāka</i> (vegetables).	(Su. U. 54/18)
Effects	Similar etiology mentioned for <i>Kuṣṭha</i> (leprosy and other skin diseases). Damage of hair on the body and nails. When a wound is infected with the <i>Krimi</i> , then the patient suffers from hyperesthesia, itching, pain and creeping sensation in the ulcerated area etc., when it grows excessively, they destroy the skin, vessels, ligaments, muscles and cartilages.	(Ca. Vi. 7/11), (A. Saṁ. Ni. 14/47), (A. Hṛ. Ni. 14/45) (Ca. Vi. 7/11)
	Blood-born diseases.	(Su. U. 54/16)
	Similar symptoms as mentioned in <i>Kuṣṭha</i> (skin diseases).	(A. Saṁ. Ni. 14/54), (A. Hṛ. Ni. 14/52)
Treatment	Similar treatment mentioned for <i>Kuṣṭha</i> (<i>Ghṛtapāna</i> , <i>Vamana</i> , <i>Virēcana</i> , <i>Raktamōkṣaṇa</i> , <i>Raktaśōdhana</i> etc.).	(Ca. Vi. 7/11), (A. Saṁ. Ci. 22/56), (A. Hṛ. Ci. 20/34)

3. *Kaphaja Krimi* (Phlegm-born)

Type of <i>Krimi</i>	Visible	(<i>Su. U. 54/19</i>)
Nomenclature	<i>Antrāda, Udarāda, Hṛdayacara, Curu, Darbhapuṣpa, Saugandhika and Mahāguda. Darbhapuṣpa, Mahāpuṣpa, Pralūna, Cīpīṭa, Pipīlikā and Dāruṇa.</i>	(<i>Ca. Vi. 7/12</i>) (<i>Su. U. 54/12</i>)
	<i>Antrāda, Udarāvēṣṭa, Hṛdayāda, Mahāruha, Curu, Darbhakusuma and Sugandha. Antrāda, Udarāvēṣṭa, Hṛdayāda, Mahākuha, Kuru, Darbhakusuma and Sugandha.</i>	(<i>A. Saṁ. Nī. 14/51</i>) (<i>A. Hṛ. Nī. 14/49</i>)
Morphology	Big and flat (tape like), round or thread like. Thin <i>Krimi</i> having shape of a sprout, hairy with dark patches on the body and tail. Thin, long, minute, <i>Prthubradhnanibha</i> (thick like leather strap) and resembles earth worm and sprouts.	(<i>Ca. Vi. 7/12</i>), (<i>Su. U. 54/13</i>), (<i>A. Saṁ. Nī. 14/49-50</i>), (<i>A. Hṛ. Nī. 14/47-48</i>)
Colour	White or coppery.	(<i>Ca. Vi. 7/12</i>), (<i>A. Saṁ. Nī. 14/50</i>), (<i>A. Hṛ. Nī. 14/48</i>)
	White	(<i>Su. U. 54/13</i>)
Habitat	<i>Āmāśaya</i> (stomach), when grows excessively, they may move upwards, downwards or to both sides.	(<i>Ca. Vi. 7/12</i>), (<i>A. Saṁ. Nī. 14/49</i>), (<i>A. Hṛ. Nī. 14/47</i>)
Causes	Intake of milk, jaggery, <i>Tīla</i> (<i>Sesamum indicum</i> Linn.), fish, meat of marshy animals, edibles of rice-flour, black gram, Sesame oil, milk products and oil of <i>Kusumbha</i> (<i>Carthamus tinctorius</i> Linn.), intake of food during indigestion, filthy food, food mixed with despicable articles like feces, incompatible food and unsuitable food.	(<i>Ca. Vi. 7/12</i>), (<i>Su. U. 54/3-6</i>), (<i>A. Saṁ. Nī. 14/48</i>), (<i>A. Hṛ. Nī. 14/45-46</i>)
	Meat, black gram, jaggery, milk, curd and oil.	(<i>Su. U. 54/17</i>)
Effects	Nausea, excessive salivation, anorexia, indigestion, fever, fainting, yawning, sneezing, flatulence, malaise, vomiting, emaciation and dryness of the body excessive sneezing and sinusitis.	(<i>Ca. Vi. 7/12</i>), (<i>A. Saṁ. Nī. 14/52</i>), (<i>A. Hṛ. Nī. 14/50</i>)

	They damage bone-marrow, eyes, palate, ears and shoulders, diseases of head and heart, vomiting and cold.	(Su. U. 54/14)
Treatment	<i>Śirōvirēcana</i> , <i>Vamana</i> and <i>Śamana</i> .	(A. Sat̄. Ci. 22/55), (A. Hṛ. Ci. 20/33)
4. Purīṣaja Krimi (Faeces-born)		
Type of <i>Krimi</i>	Visible	(Su. U. 54/19)
Nomenclature	<i>Kakēruka</i> , <i>Makēruka</i> , <i>Lēliha</i> , <i>Sasūlaka</i> and <i>Sausurāda</i> .	(Ca. Vi. 7/13)
	<i>Ajava</i> , <i>Vijava</i> , <i>Kīpya</i> , <i>Cīpya</i> , <i>Gaṇḍūpada</i> , <i>Curu</i> and <i>Dvimukha</i> .	(Su. U. 54/8)
Colour	White, gray, blue, green or yellow.	(A. Sat̄. Nī. 14/57), (A. Hṛ. Nī. 14/55) (Ca. Vi. 7/13), (Su. U. 54/9), (A. Sat̄. Nī. 14/56), (A. Hṛ. Nī. 14/54)
Morphology	<i>Gaṇḍūpada Krimi</i> are red. <i>Krimi</i> are minute, cylindrical and long or thick and cylindrical. Minute and some are large and tailed whereas <i>Gaṇḍūpada Krimi</i> are long. Big, round, thin or thick.	(Su. U. 54/11) (Ca. Vi. 7/13) (Su. U. 54/9,11)
Habitat	<i>Pakvāśaya</i> or colon.	(A. Sat̄. Nī. 14/56), (A. Hṛ. Nī. 14/54) (Ca. Vi. 7/13), (Su. U. 54/9,11), (A. Sat̄. Nī. 14/55), (A. Hṛ. Nī. 14/53)
Causes	Similar etiology as <i>Kaphaja Krimi</i> . Black gram, edibles of rice flour, pulses and leafy vegetables.	(Ca. Vi. 7/13), (Su. U. 54/3-6) (Su. U. 54/17)
Effects	Uncooked grains, leafy vegetables and pulses which produce more fecal matter. When <i>Krimi</i> grows excessively, they move downwards. When they move towards	(A. Sat̄. Nī. 14/48), (A. Hṛ. Nī. 14/46) (Ca. Vi. 7/13), (A. Sat̄. Nī. 14/55-56),

	<i>Āmāśaya</i> , they cause faecal odour in belching and breath.	(A. Hṛ. Nī. 14/53-54)
	Diarrhoea, emaciation, dryness and horripulation and cause irritation and itching in the anal region.	(Ca. Vi. 7/13)
	Colic, sluggish digestion, pallor, wind formation, debility, salivation, anorexia, heart disease and diarrhoea. Pricking pain when they move towards anus and <i>Gaṇḍupada Krimi</i> produce itching in anus when they fall out.	(Su. U. 54/9-10)
	Loose motions, colic, delay in digestion and stasis of digested food, emaciation, roughness of the skin, anaemia, horripulation, indigestion and itching in the anus.	(A. Sañ. Nī. 14/58), (A. Hṛ. Nī. 14/56)
Treatment	<i>Vasti</i> and <i>Virēcana</i> .	(A.Sañ.Ci.22/55), (A.Hṛ.Ci.20/33)

General line of treatment

Ācārya Caraka prescribed three folded treatment of *Krimirōga* viz. *Apakarṣaṇa*, *Prakṛtivighāta* and *Nidānaparivarjana*. *Apakarṣaṇa* (*Śamśōdhana*) is considered as the basic treatment of *Krimirōga* while *Prakṛtivighāta* and *Nidānaparivarjana* eradicate *Krimirōga* from the root. After the *Śamśōdhana* if any ova and cyst remain in the *Kōṣṭha* than *Prakṛtivighāta* and *Nidānaparivarjana* suppress the growth of *Krimi* and prevents further recurrence of *Krimirōga*. (Ca. Vi. 7/14)

1. *Apakarṣaṇa* (Extraction or Elimination)

- (1) *Krimi* especially the *Bāhya* may be extracted with the help of hand and with or without the help of instruments. (Ca. Vi. 7/15)
- (2) *Krimi* (*Dōṣa*, *Mala* and *Krimisaṅghāta*) residing inside the body are eliminated forcefully by administration of appropriate *Śamśōdhana* therapies which are of four types viz. *Śirōvirēcana* (Errhines), *Vamana* (emesis), *Virēcana* (purgation) and *Āsthāpana* (corrective type of enema). (Ca. Vi. 7/15)

2. *Prakṛtivighāta* (Annihilation of factors responsible for the production of *Krimi* or their breeding environment)

The drugs and diet, which are pungent, bitter and astringent in taste and alkali and hot in nature and also having properties contrary to properties of phlegm and feces are

the counter-acting factors responsible for the production of *Krimi*, hence should be administered internally. Any measure which will be successful against the re-infestation of *Krimi* can be included under *Prakṛtivyaghāta*. (Ca. Vi. 7/15)

3. *Nidānavarjana* (Avoiding the factors which cause *Krimi*)

The factors which are responsible for the production of *Krimi* and similar other substances should be avoided. (Ca. Vi. 7/15)

Specific line of treatment for *Kaphaja* and *Purīṣaja Krimi*

Difference in treatments for *Kaphaja* and *Purīṣaja Krimi* is advised in *Carakasamhitā*. The treatment of *Purīṣaja Krimi* involves administration of the drugs in small quantity for *Asthāpanabasti* (corrective enema), *Anuvāsānabasti* (oleation) and *Virēcana* (purgation) and for *Kaphaja Krimi*, the drugs should be used in large quantity for *Śirōvirēcana* (errhines), *Vamana* (emesis) and *Upaśamana* (palliation). (Ca. Vi. 7/27)

The antihelminthic drugs administered for *Basti* and *Virēcana* in *Purīṣaja Krimi*, cause *Anulomagati* (downward direction) of *Vāyu* and *Purīṣa* which is their normal course, hence do not require large dose of drug but for *Kaphaja Krimi* the high potency along with large dose is required to bring out the *Krimi* along with phlegm.

Treatment of *Krimi* located in different body parts

Krimi located in head, heart, nose, ear and eye should be managed particularly with *Añjana* (collyrium), *Nasya* (snuffs) and *Avapīḍana* (pressed snuffs). (Su. U. 54/34)

- (1) Powder of faeces of horse impregnated with decoction of *Viḍaṅga* (*Embelia ribes* Burm. f.) as *Pradhamana* (blowing snuff). (Su. U. 54/35)
- (2) Powders of iron or other metals impregnated with decoction of *Viḍaṅga* (*Embelia ribes* Burm. f.) used as *Pradhamana* (blowing snuff). (Su. U. 54/35-36)
- (3) Oil cooked with *Surasādi* drugs and added with bell metal wiping. (Su. U. 54/36)

Treatment of specific *Krimi*

- (1) For *Rōmāda Krimi* (worms eating away hairs), therapeutic measures prescribed for *Indralupta* (alopecia) should be adopted. (Su. U. 54/37)
- (2) For *Dantāda Krimi* (worms eating away teeth), therapeutic measures prescribed for *Mukharōga* (mouth diseases) should be adopted. (Su. U. 54/37)
- (3) For *Raktaja Krimi* (worms located in blood), therapeutic measures prescribed under treatment of *Kuṣṭha* should be adopted. (Su. U. 54/38)

Krimighna Drugs

For the purpose of *Prakṛtivīghāta* and *Apakarsaṇa*, a long list of drugs and medications are available in all the texts of Ayurveda. *Viḍaṅga* (*Embelia ribes* Burm. f.) is considered as the best *Krimighna* drug according to *Ācārya Caraka* and *Vṛddha Vāgbhaṭa*.

Śrēṣṭham ... viḍaṅgam krimighnānām (*Ca. Sū. 25/40*), (*A. Saṁ. Sū. 13/2*)

Apart from that, *Ācārya Caraka* and *Vṛddha Vāgbhaṭa* prescribed *Krimighna Mahākaṣāya* while *Ācārya Suśruta*, *Vṛddha Vāgbhaṭa* and *Vāgbhaṭa* advocated certain *Gaṇa* for the treatment of *Krimirōga*.

Krimighna Mahākaṣāya according to Ācārya Caraka (Ca. Sū. 4/11) and Vṛddha Vāgbhaṭa (A. Saṁ. Sū. 15/17)

S. No.	Drugs in <i>Krimighna Mahākaṣāya</i>	Latin Name
1.	<i>Akṣīva</i>	<i>Moringa oleifera</i> Linn.
2.	<i>Marīca</i>	<i>Piper nigrum</i> Linn.
3.	<i>Gaṇḍīra</i>	<i>Euphorbia antiqurum</i> Linn.
4.	<i>Kēbuka</i>	<i>Costus speciosus</i> Koenig Sm.
5.	<i>Viḍaṅga</i>	<i>Embelia ribes</i> Burm. f.
6.	<i>Nirguṇḍī</i>	<i>Vitex nigundo</i> Linn.
7.	<i>Kīṇihī</i>	<i>Achyranthes aspera</i> Linn.
8.	<i>Śvadamīṣṭrā</i>	<i>Tribulus terrestris</i> Linn.
9.	<i>Vīṣaparṇikā</i>	A variety of <i>Ipomoea reniformis</i> Chois.
10.	<i>Ākhuparṇikā</i>	<i>Ipomoea reniformis</i> Chois.

Krimighna Gaṇa

S. No.	<i>Suśrutasamhitā</i> (<i>Su.Sū.38/16-19, 62-65</i>)	<i>Aṣṭāṅgasaṅgraha</i> (<i>A.Saṁ.Sū. 16/11-12,20-23</i>)	<i>Aṣṭāṅgahr̥daya</i> (<i>A. Hṛ.Sū. 15/19-20,28-31</i>)	<i>Karma</i>
1.	<i>Arkādigaṇa</i>	<i>Arkādigaṇa</i>	<i>Arkādigaṇa</i>	<i>Krimikuṣṭhapraśamana, Vraṇaśōdhana, Kaphamēdōviṣāpaha</i>
2.	<i>Surasādigaṇa</i>	<i>Surasādigaṇa</i>	<i>Surasādigaṇa</i>	<i>Kriminiṣūdana, Vraṇaśōdhana, Kaphahṛt</i>
3.	<i>Trapvādigaṇa</i>			<i>Garakrimihara</i>
4.	<i>Lākṣādigaṇa</i>			<i>Kuṣṭhakrimihara, Duṣṭavraṇaśōdhana, Kaphapittārtināśana</i>
5.		<i>Asanādigaṇa</i>	<i>Asanādigaṇa</i>	<i>Kuṣṭhakaphakrimivijaya</i>

Pathya (Wholesome)

- (1) For all types of *Krimi*, *Surasādi* drugs should be used for food, drink, bath etc. (*Su. U. 54/38*)
- (2) Food having the taste of bitter and pungent used in all types of *Krimi*. (*Su. U. 54/39*)
- (3) *Yavakṣāra* mixed with alkali-water of *Kuluttha* (*Dolichos bipinnata* Stapf.). (*Su. U. 54/39*)
- (4) *Yavāgū* (Gruel) - The patient should drink *Yavāgū* prepared with *Viḍaṅga* (*Embelia ribes* Burm. f.), *Kṛṣṇā* (*Piper longum* Linn.), *Marica* (*Piper nigrum* Linn.), *Pippalīmūla* (root of *Piper longum* Linn.), *Śigru* (*Moringa oleifera* Lam.) prepared with *Takra* (buttermilk) and salted with *Sarjikākṣāra*. (*A. Saṁ. Ci. 22/45*), (*A. Hṛ. Ci. 20/25*)

Apathya (Unwholesome)

Patient of *Krimirōga* should avoid the things which are sour and sweet, milk, meat, ghee, curds, leafy vegetables, jaggery and cold things. (*Su. U. 54/40*), (*A. Saṁ. Ci. 22/57*), (*A. Hṛ. Ci. 20/35*)

Discussion and Conclusion

The concept of *Krimi* / *Kṛmi* is very wide in the Vedic as well as Ayurvedic literature. The entire organism which is dependent for food and shelter upon the human body can come under the term *Krimi* / *Kṛmi*. The Veda have been the storehouse of the fundamental principles of all physical sciences and the system of Medicine. The utterances and invocations of the *Atharvaṇa* are, however, to be considered as the base of the later Medical science. The concept of *Krimirōga* is elaborately discussed in Vedic literature. The description of *Krimirōga* is cited in four distinct chapters in *Atharvavēda*. Though the treatment of *Krimi* is mainly focused on *Daivavyapāśraya Cikitsā* (through mantra i.e. incantations and rituals) in *Atharvavēda*, *Yuktivyapāśraya Cikitsā* is also given due importance as there is mentioning of certain herbs for the treatment of *Krimi* afflictions (antihelminthic).

The detailed description of *Krimi* can be found in all Ayurvedic treatises especially in *Bṛhatrayī*. There are twenty types of *Krimi* classified under three groups i.e. *Śīṣmaja*, *Śōṇitaja* and *Purīṣaja* in *Bṛhatrayī*. *Ācārya Caraka* and *Vāgbhaṭa* both acknowledged *Bāhyamalaja Krimi* into another group whereas *Ācārya Suśruta* didn't consider it as separate group. *Ācārya Caraka* stated another type of *Krimi* called *Sahaja Krimi* (non-pathogenic organism) which normally inhabit the body but do not cause any morbidity. While describing the *Krimirōga*, *Ācārya Caraka* explained diagnostic methodology of the diseases based on seven significant aspects i.e. *Samutthāna*, *Sthāna*, *Saṁsthāna*, *Varṇa*, *Nāma*, *Prabhāva* and

Cikitsā in *Vyādhitarūpiyavimāna* in *Vimānasthāna* of *Carakasamhitā*. In the line of treatment of *Krimirōga*, he described three principles of treatment i.e. *Apakarṣaṇa*, *Prakṛtivyaghāta* and *Nidānavarjana* and advocated that these principles of treatment are also applicable for all diseases in general i.e. *Apakarṣaṇa* as *Samśōdhana*, *Prakṛtivyaghāta* as *Samśamana* and *Nidānavarjana*. In the treatment of *Krimirōga* *Ācārya Caraka* and both *Vāgbhaṭa* described different sequence of *Pañcakarma* (*Āsthāpana*, *Vamana-Virēcana* (simultaneously) and *Anuvāsana*) whereas *Ācārya Suśruta* adopted standard order of *Pañcakarma*. In the preparation of medicine for *Samśōdhana*, all *Ācārya* have added antihelminthic drugs. It causes both *Apakarṣaṇa* and *Prakṛtivyaghāta* at the same time. It appears to be, after complete study, the idea behind the description of *Krimirōga* in *Vimānasthāna* of *Carakasamhitā* was to enlighten the research methodology for the diagnosis of diseases, otherwise it would have been described in *Cikitsāsthāna*.

On the basis of above description, in a nutshell, the term *Krimi* described in Vedic and Ayurvedic literature includes all sorts of organisms i.e. insects, bacteria, helminthes, viruses etc. and can be correlated with the term ‘microbe’ as Microbiology doesn’t deal only with the bacteria but also with the viruses, fungi and parasites. The detailed description of *Krimi* along with its treatment bears much rational when compared with the principles of Modern Medicine.

Abbreviations

<i>Atharva.</i>	-	<i>Atharvavēda</i> ³
<i>A. Hṛ. Cī.</i>	-	<i>Aṣṭāṅgahṛdaya Cikitsāsthāna</i> ⁴
<i>A. Hṛ. Nī.</i>	-	<i>Aṣṭāṅgahṛdaya Nidānasthāna</i> ⁵
<i>A. Hṛ. Sū.</i>	-	<i>Aṣṭāṅgahṛdaya Sūtrasthāna</i> ⁶
<i>A. Sam. Cī.</i>	-	<i>Aṣṭāṅgasaṅgraha Cikitsāsthāna</i> ⁷
<i>A. Sam. Nī.</i>	-	<i>Aṣṭāṅgasaṅgraha Nidānasthāna</i> ⁸
<i>A. Sam. Sū.</i>	-	<i>Aṣṭāṅgasaṅgraha Sūtrasthāna</i> ⁹
<i>Ca. Vi.</i>	-	<i>Carakasamhitā Vimānasthāna</i> ¹⁰
<i>Ca. Sū.</i>	-	<i>Carakasamhitā Sūtrasthāna</i> ¹¹
<i>Kau. Sū.</i>	-	<i>Kauśikasūtra</i> ¹²
<i>Kau. Pa.</i>	-	<i>Kauśikapaddhati</i> ¹²
<i>Su. Sū.</i>	-	<i>Suśrutasaṅgraha Sūtrasthāna</i> ¹³
<i>Su. U.</i>	-	<i>Suśrutasaṅgraha Uttarantra</i> ¹⁴

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सारांश

क्रिमिरोग – एक चिकित्सिकीय ऐतिहासिक अध्ययन

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उष्णकटिबन्धी प्रदेशों में क्रिमिरोग एक सामान्य रोग है। लगभग आधी से अधिक जनसंख्या इस रोग से ग्रसित होती है। भारतवर्ष में कृमि एवं क्रिमि शब्द का ज्ञान वैदिक काल से ही है। वैदिक एवं आयुर्वेदीय साहित्य में क्रिमिरोग के नाम, कारण और चिकित्सा से सम्बन्धी अनेक सन्दर्भ उल्लिखित हैं। आधुनिक क्रिमिविज्ञान के इतिहास की शुरुआत 'एबर्स पेपिरस' (सन् १५५०) से हुई है।

संस्कृत भाषा में क्रिमि शब्द की उत्पत्ति 'क्रम' शब्द के साथ 'इनि' प्रत्यय लगाने से हुई है। क्रिमि शब्द का अर्थ क्षुद्र जन्तु एवं रेंगने अथवा कूदने (छलांग लगाने) वाले सूक्ष्म जीव या उड़ने वाले कीट हैं। आधुनिक चिकित्सा विज्ञान के अनुसार क्रिमि शब्द की व्याख्या रोगोत्पादक एवं सहज क्रिमि दोनों हैं, जिन्हें वाइरस, बैक्टीरिया या पेरेसाईट कहते हैं।

आचार्य चरक ने क्रिमिरोग का वर्णन हेत्वादिसप्तकगण (हेतु आदि सात पहलुओं) के आधार पर किया है। चरकसंहिता-विमानस्थान में स्थित क्रिमिरोग के विस्तृत वैज्ञानिक वर्णन के अध्ययन से ऐसा प्रतीत होता है कि आचार्य चरक ने रोग-अनुसन्धान-पद्धति को समझाने के लिए श्रेष्ठ उदाहरण के रूप में इसका वर्णन किया है। क्रिमिरोग के चिकित्सा-सिद्धान्त को आचार्य चरक ने तीन चिकित्सा-सिद्धान्तों अपकर्षण (संशोधन), प्रकृतिविघात (संशमन) और निदानवर्जन के रूप में स्पष्ट किया है। इस लेख में अथर्ववेद एवं बृहत्त्रयी (चरकसंहिता, सुश्रुतसंहिता, अष्टांगसंग्रह और अष्टांग दय) में उपलब्ध क्रिमिरोग सम्बन्धित साहित्य को संकलित करके प्रस्तुत किया गया है।