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## Concept of Krimi and its scientific understanding

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## ABSTRACT

The term Krimi is frequently used in ancient Ayurveda classics from the Vedic period. In The etiology of many diseases, microbial relation played very important role and it is also a causative factor for various pathological condition like weight loss, Anemia, Vomiting, Headache etc. The Krimi may be external or internal in nature. Their mode of transmission, sign, symptoms are almost same as worm and microbes in contemporary science. They had given the description of structure, Naming of Krimi as far as possible. The Krimi described in ancient text are more or less similar to microbes and helminths mentioned in present time. The term Krimi has been used in broader sense. It indicates all pathogenic and non pathogenic organisms covering wide range of infectious pathogens. Ayurveda has advised specific drugs for specific Krimi. Here an effort has been made to understand the Krimi in all the ways possible.

Key words: Krimi, Worm, Microbes, Helminthes, Abhyantara Krimi, Bahya Krimi

## **INTRODUCTION**

From very early times it is speculated that diseases may result from invasion of the body by external infectious organisms acknowledged as Krimi. Krimi is a condition, affecting all age groups, but Children are at risk due to their activities such as play and lack of proper personal hygiene. From the children, the entire family may eventually get affected.<sup>[1]</sup> If we consider Drishya Krimi as worms, In India, more than 200 million children are infected with roundworm, hookworm, and whip worm. Hookworm is more prevalent among children in South India.<sup>[2]</sup> According to WHO, 1100 million people were defecating in the open resulting in high levels of

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environmental contamination and exposure to the risk of worm infestations in year 2008.<sup>[3]</sup>

Samhitakaras were well aware regarding the presence of microorganisms and have given maximum descriptive contributions. As mentioned in Shabdakalpadruma, Krimi is derived as "Bhrame Samprasarane Cha" means which moves with Pada or legs (podia).<sup>[4]</sup> Parvata, Vana, Oushadhi, Pashu, Apshu etc are the areas of *Krimi* origin according to *Veda*.<sup>[5]</sup> Krimi derived from Dhatu "Kunja Himsayam" which literary means either to produce fatal effects or to destroy.<sup>[6]</sup> Charaka informed one of the factors for Krimi production in the body is Kleda.<sup>[7]</sup> As in contemporary science there is separate branch of helminthology and microbiology but in Ayurveda the word Krimi is for all worm and microbes either it is visible or invisible. It is very important to understand the term Krimi and step by step management of *Krimiroga* especially in children in proper way designated by text of Ayurveda as it is not well established practically.

## **Classification of Krimi**

Atharva Veda divided the Krimi into 2 classifications, from which one is Drishta and Adrishta and the second

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is *Durnama* and *Sunama Krimi*, which may be accepted as visible, invisible, pathogenic and non-pathogenic.<sup>[8]</sup>

Acharya Charaka classified *Krimi* into two broad groups i.e., *Sahaja* and *Vaikarika*. (Table. 1 & 2)

#### Table 1: Krimi classification

Sahaja Krimi / Avaikarika Krimi	Vaikarika Krimi
Live in human body right from	Live in human body not from
birth until death	birth
Not harmful but are helpful to	Harmful or cause disease or
human body	deformity in body
Numerous in number live in the buccal cavity, alimentary tract as well as in vaginal canal of female as a normal bacterial flora.	Pathogenic in nature

## Table 2: Classification of Vaikarika Krimi

<b>Bahya</b> Krimi (Charaka and Vagbhata)	Abhyantara Kri	<b>imi</b> (Sushruta)	
1) Yuka	Adrishya	Drishya	
2) Pippilika	Raktaja - 6	Kaphaja - 7	Purishaja - 5
	Keshada	Antrada	Kakeruka
	Lomada	Udarada	Makeruka
	Lomadvipa	Hridyachara	Leliha
	Sourasa	Churu	Sashulaka
	Audambara	Darbhapushpa	Sausurada
	Jantumatra	Saugandhika	
		Mahaguda	

#### Nidana

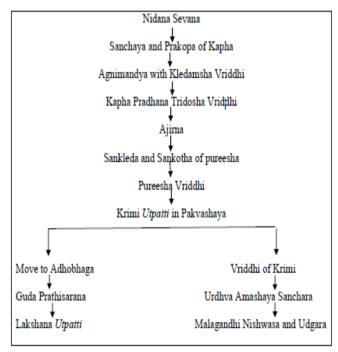
Nidanas for Krimi Utpatti are Mandagni, Dosha Vriddhi, Sankotha and Sankleda of Mala and suitable environment for growth and development of Krimi.

"Mrija Barjana" means unhygienic and dirty habits produces the Bahya Krimi.<sup>[9]</sup> Ajeernabhojana, regular intake of Madhura and Amla Rasa, consumption of Drava substances, Guda, Virudhha Bhojana, Some physical factors like Divaswapna and Avyayama are the common causative factors for Abhyantar Krimi.<sup>[10]</sup> Vishista Nidanas are Dugdha, Guda, Tila, Matsya, Anupa Mamsa, undercooked, incompatible and unwholesome articles for Kaphaja Krimi.<sup>[11]</sup> Susruta mentioned Vidala, Parnasaka, Masa, Pistanna etc. for Purisaja Krimi<sup>[12]</sup> and Incompatible food and vegetables, change from cold to hot and vice versa, sudden change of diet, improper Santarpana and Apatarpana, excessive use of honey and molasses, fish, Lakucha, Chilichima fish with curd, sour berry, Kulattha, Masa, suppressing the urge of vomiting etc. helps the production of Raktaja Krimi same as the etiology of Kustha<sup>[13]</sup>

All the above said factors provide an appropriate environment for the worms to manifest and infest causing serious health hazards.

#### Samprapti

Explained in Fig. 1



## Samanya Lakshana

General sign and symptoms of *Krimi Roga* is described in *Samhitas* include *Jvara* (fever), *Vivarnata* (skin

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discoloration), *Sula* (acute pain in abdomen), *Hridroga*, *Bhrama* (vertigo), *Bhaktadwesa* (anorexia), *Atisara* (diarrhea) *Sadana* (malaise) and *Chhardi* (vomiting).<sup>[14]</sup>

## Vishesha Lakshana

r.

Lakshanas are explained in Table. 3

#### Table 3: Lakshanas of Krimi

Bahya Krimi	1) Yuka	<i>Krimi</i> which mixes with the colour of hair and cloth and creates disease condition.
	2) Lakshyate - Leeksha	Eggs of "Yuka" and people can also see it on the hair and cloths.
Sleshmaja Krimi	Antrad	Eats Intestine and destroyer of Intestine.
	Hrudayadah	Responsible for heart disease.
	Udaradaha	Lives in abdomen.
	Charuhu	Steals digested food and also takes <i>Rasadi Dhatu</i> or <i>Krimi</i> which creates <i>Avipaka</i> and <i>Arochaka</i> .
	Sougandhika	Have specific odour and spreads specific smell.
	Darbhapushp a	Have shape like flower.
	Mahapushpa	Found in large number like the flower of " <i>Aparajita</i> ".
	Praluna	Have segmented body (like flat worms).
	Chipita	Very small in size and flat.
	Daruna	Create excessive pain.
	Udaraveshta	Produced in stomach and covered by abdomen.
Raktaja Krimi	Keshada	Catch the hair of scalp and destroy it.
	Lomada	Destroys skin hair.

	Lomadvipa	Lives in the root of skin hair.
	Saurasa	Born and grow due to excessive use of sweet food
	Udumbara	Have shape and color like fruit of <i>Udumbar</i> or <i>Krimi</i> which overcome the hollow space of blood vessels and create very much noise
	Romada	Destroys the skin hair.
	Nakhada	Creates the pathologies of nail which can also destroy the nail bed.
	Dantada	Causes dental disorders (caries).
	Kikkisa	Specifically found in pregnant lady and create itching and scars on lower abdomen.
	Kushthaja	Create skin diseases.
	Parisarpa	The crippling movement of Krimi.
	Matara	Have capacity of producing eggs excessively
Pureeshaj a Krimi	Kakeruka	Highly motile in nature.
a krimi	Makeruka	Takes shape of Mudrika.
	Sausurada	Shelters on <i>Madya</i> etc. Fermented materials.
	Leliha	Continuously licks (feeds) and consumes the <i>Dhatus</i> (nutrients).
	Sashoolaka	Produce pain in host.
	Кіруа	Grows by consuming <i>Sarira Dathus</i> (nutrients).
	Chipya	<i>Chipatakara -</i> flat.
	Gandupada	Resembles earthworm.
	Churu	Consumes formed <i>Rasadi</i> Dhatus.
	Dwimukha	One which has 2 faces (mouth/suckers)

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## Chikitsa

*Chikitsa* of *Krimiroga*, in almost all *Samhitas* is much emphasized and advised systematically.

In Atharva Veda, Sunrays are considered to kill the *Krimi*. Now a day it is proved that sun rays contain ultra violet radiations which have the properties to kill the bacteria. In *Vedas*, the reference of *Agni* is found for the treatment of *Krimi*.

## According to Acharya Kashyapa (Ka.Chi.Krimichikitsa)

 सर्वकृमीन् प्रणुदति वज्रो मुक्त इवासुरान्तिक्तोष्णकटुरूक्षाणां मूत्राणां लवणस्य चस्नेहस्वेदोपसेवा च पथ्यं च कृमिनाशने ।

For destruction of *Krimi*, use of *Tikta*, *Katu*, *Ruksha*, *Mutra*, *Lavana*, *Snehana*, *Swedana* should be done.

 प्रत्युष्णं कटुतैलं तु गुदे दत्त्वा ससैन्धवम् स्वेदयेद् गुदमङ्गल्या तथाऽऽशु लभते सुखम् ।

Application of lukewarm mustard oil + *Saindhava* in *Guda Pradesha*, followed by *Anguli Sweda* this gives immediate relief to the child.

After considering different classics for the treatment, following treatment principle of *Charaka* can be adopted.

## 3 Aspects of Krimi Chikitsa - Apakarshana, Prakruti Vighata, Nidana Parivarjana

## 1. Apakarshana

The word *Apakarshana* derived as "*Krush Vilekhane Dhatus*", It means to scratch or remove or extracted the *Dosha*, *Mala* or unwanted elements forcefully from the body. *Apakarshana* of *Krimi* includes the manual and instrumental removal of *Krimi* where it is applicable.

Apakarshana of the Bahyakrimi by manual method.

*Apakarshana* of *Abhayantara Krimi* is explained in Table. 4

## Table 4: Apakarshana

<b>Shirovirechana</b> (Pradhaman, Pratimarsha and Avapidananasya)	Effect over the mucosa Stimulates the nerve ending.	With the Katu Tikta Rasa and Ushna Guna, the Krimi as well as Doshas are driven
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		off by Shirovirechana.
Vamana	<i>Amashaya</i> - seat for production of <i>Kapha</i>	When it is vitiated, it produces <i>Kaphajavikara</i> as well as <i>Kaphajakrimi</i> , for its elimination <i>Vamana</i> therapy is applicable.
Virechana	Pachayamanashaya / Pakvashaya - main seat for acting Virechana drug.	When Krimi is in Pachyamanashay a the method of Apakarshana is Virechana with the Krimighna drug having the capacity to do Virechana.
Asthapana Basti	The active principles or the medicine will directly reach at the site of <i>Krimi</i> 1) <i>Kriminashano</i> <i>Vidangaadya</i> <i>Prasritko</i> Niruha (As.S.K.4) 2) <i>Kriminashano</i> <i>Niruha</i> Yoga (Chakrapani) 3) <i>Dashmooladi</i> <i>Niruha</i> Basti (Su.Chi.38/64-66) 4) <i>Krimi</i> Kusthaapaha <i>Prasritiko</i> Niruha Basti (As.S.K.4)	Kashayadravya i.e., contents of Asthapanabasti has Karshan Guna and they the growth of Krimi and its activities.

## 2. Prakriti Vighatana

Prakriti = Utpadakakarana.

Vighata = to destroy.

That is any measures which will be successful against the infestation and reinfestation of *Krimi*.

After doing *Samshodhan Chikitsa*, if their *Prakriti* is not altered, the disease will occur again.

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Having Vitiated Kapha - Agnimandya - formation of Ama = formation of Kaphajakrimi. During Sara Kitta Vibhajan if Vijatiya portion (Kittabhaga) due to any reason accumulates in Pakwashaya, Kotha (Putrefaction) - formation of Pureeshajakrimi. [Here Pureesh = act as its Prakriti]

That's why *Charakacharya* has advised to make use of *Dravyas* which possess the opposite properties to that of *Kapha* and *Purisha* for *Prakritivighata* which is mentioned in Table. 5

#### Table 5: Prakriti Vighatana

Swarasa	Palashabeeja with rice water, Paribhadra Patra with honey, Karanjatwak, Sireesa, Apamarga, Surasadi group medicines
Churna	Palashabeeja, Vidanga, Kampillaka, Yavani, Ativisa, Maricha, Vachadi, Nimba, Bhoonimba Churna, Vidangaadi Churna, Krimighna Churna
Kwatha	Triphala, Vidanga, Dadimatwak, Surasadi, Khadiradi, Kharjurapatra, Mustadi, Bhoonimbadi Kwath.
Kalka	Nimba Kalka, Vidanga - Pippali Kalka etc.
Avaleha	Pippalyadi, Paribhadra Avaleha.
<i>Asava</i> and <i>Arista</i>	Vidangarista, Khadirarista.
Taila	Surasadi Taila, Vidangadi Taila, Bhallataka Taila, Dhatura Taila, Katu Taila.
Ghrita	Vidanga Ghrita, Triphala Ghrita.
Yoga	Vidangadi Takra Yoga, Surasadiganayoga, Vidanga Bhallataka Yoga, Katukavidanga Yoga etc.
Gutika	Krumighatini Gutika, Lakshadivati.
Khanda	Haridrakhanda
Rasa	Krimimudgara Rasa, Krimi Kuthara Rasa, Vidangadi Loha, Krimikalanala Rasa.
Реуа	Vidangadi Peya.
Manda	Vidangadi Manda.

Dhoopa	Krimighna Maheshwara Dhoopa, Lakshadi Dhoopa
Bhasm	Lohabhasma, Vangabhasma
Daiva Vyapashraya Chikitsa	Mantra, Japa, Puja etc., are included and the natural substances like Maruta, Jala, Megha are praised to destroy worms.

#### 3. Nidana Parivarjana

It is followed after *Prakruti Vighata*. The factors told as *Nidana* and *Dravya* similar to the qualities of *Nidana* should be discarded or avoided from the usage, explained in Table. 6.<sup>[13]</sup>

## Table. 6: Nidana Parivarjana

## DISCUSSION

The word *Krimi* broadly described. From the Vedic period its existence was felt. But details of it is somewhat found in later period. In modern science due

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to invention of microscope the study of microbes become easy. Among the two types of Krimi - Drishya and Adrisya, the Adrishya one is Anumangamya. The three types of Rogipariksha mentioned in Avurvedic text among which Anumana is used for Adrishya Krimi. Medical microbiology is the study of microbes, which are invisible to the unaided eye, includes bacteria, protozoa, algae, fungi and acellular agents like viruses. Whereas Medical parasitology deals with parasites includes unicellular protozoans and multicellular helminthes. But in Ayurveda single terminology Krimi includes both macro and micro organisms. The correlation of the *Krimi* with microbes and parasites depend upon their habitat, available morphological character along with sign and symptoms they produce in host. Individual probable correlation of all the Krimi with microorganisms is quite difficult but some of the Krimi produce similar features like microbes and parasites. Few attempts had been made by Ayurvedic scholars to correlate the types of Abhyantara Krimi with parasites and other microorganisms described in modern literature.

*Bahya Krimi, Yuka* can be compared with louse (head, body, pubic) and eggs of louse which stick to the root of hair.

Raktaja Krimi are those which reside and travel in Raktavaha Sira and Dhamani, they are very minute, without legs, coppery colour, can't visualized by naked eye and produce Kustha like diseases, Nakha, Loma Dhwamsa, Brana, Twak, Sira, Snayu, Tarunasthi Bhakshana etc. Here some examples of microbes in blood stream which produce similar feature in body. Bacteria - Staphylococcus, Streptococcus Pyogens, Beta Streptococcus Haemolyticus. Fungi Epidermophytes, Candida albicans, Tinea corporis, Tinea imbricata, Tinea cruris, Tinea barbae, Tinea capitis. Parasites - Plasmodium, Trypanosomes, Wuchereria.

The *Kaphaja Krimi* resides in upper part of gut, but when increases in numbers travel through both direction of gut. They have different shapes like thick, flat, elongated, rounded, ring like etc. and produce nausea, salivation, anorexia, indigestion, fever, REVIEW ARTICLE

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syncope, vomiting, emaciation etc. The following parasites can be compared with *Kaphaja Krimi*. **Parasite** - Ancylostoma duodenale, Taenia solium,Taenia saginata, Trichinella spiralis, Ascaris lumbricoides

Purisaja Krimi lives in lower gut but when increase in numbers travels through upper and lower part of gut. Their size varies from microscopic to macroscopic and produces clinical features like diarrhea, emaciation, pallor, horripilation, perianal itching etc. The following organisms may be the probable correlation of *Purisaja Krimi*. **Bacteria** - Vibrio cholera, E.coli, Salmonella, Shigella. **Virus** - Rota virus, Astro virus, Adeno virus, Norwalk virus. **Fungi** - Candida albicans. **Parasites** -Trichuris trichiura, Enterobius vermicularis, Giardia lambia, Balantidium coli.

## **CONCLUSION**

Worm infestation is very common in paediatric age group. According to Chakrapani "Atra Samshodhanam Apaharanam Samshamanam Vighataha Tu Sabdhen Api Samaanam" Nidanavarjanam Samshodhana (elimination therapies) for the removal, Samshamana (alleviation) is for the measures of counteracting the factors responsible for the treatment of Krimi and the third principle i.e., Nidanaparivarjana (avoidance of causative factors) for prevention of further infection. Chikitsa is the one which helps to destroy the causes and pathogenesis of the disease completely. While explaining Chikitsa of Krimi, Acharyas given a systematic approach so that it can remove the pathology in a full-fledged form. The mode of treatment told is also helpful to overcome the further infections or the other diseases can cause by different types of *Krimi*. So, it can be understood that the Kramanusaraprayoga of Thrividhachikitsa here is good in both preventive and curative aspects.

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