



## Review Article

### A REVIEW ARTICLE ON *KRIMI* WITH CONTEMPORARY ASSESSMENT

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#### ABSTRACT

*Krimi* exist its importance in Medical science from ages. Starting from *Rig Veda* to *Samhita Krimi* is accepted as a causative factor of diseases. Though there is mention of non-pathological *Krimi* in the texts, but elaboration not done. Whereas, there is wide narration of pathological *Krimi* found in different *Samhita*. Description of etiologies, habitat, nomenclature, morphology, and clinical conditions produced due to *Krimi* is done by different *Acharyas*. The clinical conditions produced due to *Krimi* in host may be broadly categorized under GIT ailments, skin ailments and features of Anemia. Regarding management of *Krimi*, there is sufficient explanation of treatment principles in *Samhita*. Various research works have been done concerning treatment aspects of *Krimi*. These clinical studies emphasize the effect of herbal, mineral or herbomineral drug preparations on certain parasite or protozoan. Only few studies have been done in Ayurveda to find out the type of *Krimi* infection/infestation based on the division of *Krimi*. Some research workers had tried to correlate the *Krimi* with few parasites only. The correlation of *Krimi* with the contemporary infectious microbes may be done by examining the resemblance of their habitat, morphology and effect on host. But it is a difficult task to correlate *Krimi* with modern due to lack of detail description of individual *Krimi*. Under the word *Krimi* all micro organisms like bacteria, virus, parasite, and fungus can be included. In this article effort has been made to describe the concept of *Krimi* from different Ayurvedic treatises and also to correlate them with similar microbes and parasites based on their habitat and effect on human body.

**KEYWORDS:** *Krimi*, Microorganisms, Worms, *Raktaja*, *Kaphaja*, *Purisaja*.

#### INTRODUCTION

In medical science, sickness and death have always generate challenge to the human intellect. Ancient humans endorsed them to heavenly rage and other supernatural forces. Later different concepts were proposed for disease formation like the effect of environment, defective diet etc. From very early times it is speculated that diseases may result from invasion of the body by external infectious organisms acknowledged as *Krimi*. Ancient *Acharyas* were well aware regarding the presence of microorganisms. In *Shabdakalpadruma Krimi* is derived as "*Bhrame samprasarane cha*" means which moves with *Pada* or legs (*podia*).<sup>[1]</sup> According to *Veda Krimi* originate in different areas like *Parvata*, *Vana*, *Oushadhi*, *Pashu*, *Apshu* etc.<sup>[2]</sup> *Krimi* derived from *dhatu* "*kunja himsayam*" which literary means either to produce fatal effects or to destroy. *Charaka* informed *Kleda* in

the body is one of the factors for *Krimi* production.<sup>[3]</sup> In *Samhita* Period there is ample description regarding *Nidana*, *Bheda*, *Lakshana* and *Chikitsa* of *Krimi*. In present day science, microbiology and helminthology are the separate branches including all the worms and microbes.

#### CLASSIFICATION OF *KRIMI*

In *Atharva Veda Krimi* is divided into *Drishta* and *Adrishta* type meaning visible and invisible.<sup>[4]</sup> Also there is mention of *Durnama* and *Sunama Krimi*, which may be accepted as pathogenic and non pathogenic.

The following table shows the total number and divisions of *Krimi* according to different *Acharyas*.

Name of Achryas	Bahya Krimi	Abhyantara Krimi			Total	Total
		Kaphaja	Purishaja	Raktaja		
Charaka <sup>[5]</sup>	2	7	5	6	18	20
Susruta <sup>[6]</sup>		6	7	7	20	20
Vagabhatta <sup>[7]</sup>	2	7	5	6	18	20
Madhavakara <sup>[8]</sup>	2	7	5	6	18	20
Sarangadhara <sup>[9]</sup>	2	7	5	6	18	20 +2
Bhavaprakash <sup>[10]</sup>	2	7	5	6	18	20

### Nomenclature

The following table shows the nomenclature of *Bahya* and *Abhyantara Krimi* according to different *Acharyas*.

Type of Krimi	Charaka	Sushruta	Vagabhatta
Bahya	Yuka, Pippilika		Yuka, Liksha
Kaphaja	Antrada, Udarada, Hrudayacara, Curu, Darbhapuspa Saugandhika, Mahaguda	Mahapuspa, Praluna, Cipita, Pipilika, Daruna, Darbhapuspa	Antrada, Hrudayada, Udaravesta, Curu, Mahaguda, Sugandha, Darbhakusuma.
Purisaja	Kakeruka, Makeruka, Sausurada, Sasulaka, Leliha	Ajava, Vijava, Kipyra, Cipyra, Gandupada, curu, Dvimukha	Kakeruka, Makeruka, Sausurada Sasulaka, Leliha
Raktaja	Kesada, Lomada, Lomodvipa, Saurasa, Audumbara, Jantumatarah	Kesada, Romada, Nakhada, Dantada, Kikkisa, Kusthaja, Parisarpa	Kesada, Lomavidhwamsa, Lomadvipa, Saurasa, Udumbara, Matarah

### Site of Localisation of krimi

All the Acharyas have mentioned all most same areas for different *Krimi*.

Type of Krimi	Charaka <sup>[11]</sup>	Sushruta <sup>[12]</sup>	Vagabhatta <sup>[13]</sup>
Bahya Krimi	Hair, Eyelashes, Skin, Clothing		Hair, Clothing
Kaphaja Krimi	Amasaya, from Amasaya spread up and down	Amasaya	Amasaya, spread every where
Purishaja Krimi	Pakwasaya, spread towards anus and also towards Amasaya	Pakwasaya	Pakwasaya, spread towards anus and also towards Amasaya
Raktaja Krimi	Raktavahini, dhamani	Dhamani	Raktavahi Sira

### Etiology of Krimi Production

Mention of etiological factors for both *Bahya* and *Abhyantara Krimi* is there in *Samhitas*. The *Bahya* or external *Krimi* are produced due to "Mrija barjana" means unhygienic and dirty habits.<sup>[14]</sup> Regarding *Abhyantar Krimi* some general and some specific etiological factors mentioned. The common causative factors include *Ajeernabhojana*, regular intake of *Madhura* and *Amla rasa*, consumption of *Drava* substances, *Guda*, *Virudhha bhojana* etc. Some physical factors are also mentioned in common *Nidan* like *Divaswapna* and *Avyayama*.<sup>[15]</sup>

*Vishista nidanas* are separate for *Kaphaja*, *Purisaja* and *Raktaja Krimi*.

**Kaphaja Krimi-** *Dugdha*, *Guda*, *Tila*, *Matsya*, *Anupa mamsa*, undercooked, incompatible and unwholesome articles.<sup>[16]</sup>

**Purisaja Krimi-** Charaka has mentioned the same etiological factors those described in *Kaphaja Krimi*. Apart from these *Susruta* added *Vidala*, *Parnasaka*, *Masa*, *Pistanna* etc are responsible for production of *Krimi*.<sup>[17]</sup>

**Raktaja Krimi-** The *Acharyas* have mentioned that the etiology of *Kustha* and *Raktaja krimi* are same. 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*.<sup>[18]</sup>

All the above said factors either individually or all together predispose for worm or parasitic infestation i.e., they provide an appropriate

environment for the worms to manifest and infest causing serious health hazards.

### Sign and Symptoms

Both general and specific sign and symptoms of *Krimi Roga* is described in *Samhitas*. The general sign and symptoms include *Jvara* (fever), *Vivarnata* (skin discoloration), *Sula* (acute pain in abdomen), *Hridroga*, *Bhrama* (vertigo), *Bhaktadwesa* (anorexia), *Atisara* (diarrhea) *Sadana* (malaise) and *Chhardi* (vomiting).<sup>[19]</sup>

### Specific sign and symptoms

**Bahya Krimi** - Itching and urticaria rashes in the body.<sup>[20]</sup>

**Kaphaja Krimi** - *Hrillasa*, *Asyasamsravana*, *Avipaka*, *Arochaka*, *Jvara*, *Murchha*, *Jrimbha*, *Kshavathu*, *Anaha*, *Angamarda*, *Chhardi*, *Karshya*, *Parusya*, *Kasa*, *Pinasa*, *Sula*, *Svayathu*, *Hridroga*, *Pratisyaya*, *Siroroga*.<sup>[21]</sup>

**Purisaja Krimi**- *Purisabheda*, *Karshya*, *Parusya*, *Lomaharsa*, *Gudaniskramana*, *Gudakandu*, *Sula*, *Agnimandya*, *Pandu*, *Visthambha*, *Balakshaya*, *Praseka Aruchi*, *Hridroga*.<sup>[22]</sup>

**Raktaja Krimi** - *Raktaja vyadhi*, *Kesa Samshru Nakha*, *Loma Pakshma*, *Dhwamsa*, *Harsa*, *Kandu*, *Toda*, excessively grown *Krimi* eat away skin, vessels, ligaments, muscles, cartilages and tissues.<sup>[23]</sup>

A person who is affected can experience any range of these symptoms, however complications happen more often and more severely in older people, children and in people who already suffering from other debilitating diseases.

### Treatment Principle

Ayurvedic *Samhitas* have taken up treatment aspects elaborately along with preventive aspect. Almost all of them described three treatment methods- *Apakarshana*, *Prakriti vighatana* and *Nidana parivarjana*.<sup>[24]</sup>

*Apakarsana* is the first line of treatment. In this mode of treatment expulsion of *Krimi* and the allied *Malas* from the host carried out through mechanical means or by therapeutic measures.

In *Prakriti Vighatana* treatment destruction of the favorable environment for the growth of *Krimi* is done. External medicaments like *Abhyanga*, *Sveda*, *Pradeha* etc., and some internal medicines of antimicrobial nature are given to destroy the *Krimi*.

*Nidana parivarjana* includes avoidance of dietetic regimens as well as those habits which are conducive for the formation of *Krimi*. It inhibits the growth of microbes and parasites and also prevents the secondary infection or reinfestation.

### DISCUSSION

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* and *Liksha* 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.

Infectious organisms	Name	Clinical features
Bacteria	Staphylococcus <sup>[25]</sup>	Folliculitis, boils, abscess
	Streptococcus Pyogens <sup>[26]</sup>	Erysipelas, impetigo, pyoderma, subcutaneous infections like cellulitis, necrotizing fasciitis
	Beta Streptococcus <sup>[27]</sup> Haemolyticus	Nail and body hair damage
Fungi	Epidermophytes, <i>Candida albicans</i> , <i>Tinea corporis</i> , <i>Tinea imbricata</i> , <i>Tinea cruris</i> , <i>Tinea barbae</i> , <i>Tinea capitis</i> , <i>Favus</i> <sup>[28]</sup>	Produce a variety of localized skin infection in scalp, body and nail
Parasites	Plasmodium, <sup>[29]</sup> Trypanosomes, <sup>[30]</sup> <i>Wuchereria</i> <sup>[31]</sup>	Reside in blood stream to complete their life cycle and produce fatal parasitaemia

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, syncope, vomiting, emaciation etc. The following parasites can be compared with *Kaphaja krimi*.

Name of Parasite	Clinical Features
Ancylostoma duodenale [32]	Abdominal pain, nausea, vomiting, diarrhea with blood, anemia, listlessness
Taenia solium and Taenia saginata [33]	Nausea, abdominal discomfort, hunger pain, chronic indigestion, diarrhea alternating with constipation
Trichinella spiralis [34]	Nausea, vomiting, diarrhea, abdominal pain
Ascaris lumbricoides [35] [36]	Nausea, vomiting, malnutrition, intestinal obstruction

*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*.

Type of Organism	Name of Organism	Clinical Features
Bacteria	Vibrio cholera, E.coli, Salmonella, Shigella [37]	Diarrhea, dysentery, enteric fever, gastro enteritis.
Virus	Rota virus, Astro virus, Adeno virus, Norwalk virus [38]	Severe diarrhea and lethargy
Fungi	Candida albicans [39]	Diarrhea
Parasites	Trichuris trichiura, Enterobius vermicularis, Giardia lamblia, Balantidium coli [40]	Dysentery, watery diarrhea, colitis, abdominal pain, distension, nausea, anorexia, mucus/bloody diarrhea, loss of weight, intense pruritus of perianal and perineal area

## CONCLUSION

*Krimi* is broadly described for worms and microorganisms. Its existence was felt from Vedic period, but details found later in *Samhita* period. In modern era due to invention of microscope the study of microbes become easy. Among the two types of *Krimi* *Drishta* and *Adrishta*, the *Adrishta Krimi* is *Anumanagamy*. In *Samhita* classification, nomenclature, etiology, sign symptoms, and treatment is well described on *Krimi*. The infected microbes enter into the body through contaminated soil, water, food and also transmitted either by sexual intercourse, physical contact with human or animals, through the expired contaminated air. The general symptoms can be divided into three categories like, GIT manifestation, skin manifestation, and anemia as per modern literature. From their clinical features and habitat inside host these *Krimi* can be compared with various bacteria, viruses, fungi, and parasites described in modern science. *Apakarshana*, *Prakriti Vighatana*, and *Nidana Parivarjana* are the principles of treatment applied for *Krimi*.

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