

## ***Approach to Krimi Roga (Worm Infestation) in Pediatrics***

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### **ABSTRACT**

*In Ayurveda, Krimi Rogahas been described as one of the most common disorders among children due to their delicate physiology, irregular dietary habits, and immature digestive capacity. The condition corresponds to worm infestation or parasitic infection in modern science, which is a significant cause of morbidity among pediatric populations worldwide. The Ayurvedic concept of Krimi includes both Antarjā Krimi (internal) and Bāhya Krimi (external), depending on their site of manifestation. Pediatric Krimi Roga primarily affects the gastrointestinal tract, leading to symptoms such as abdominal pain, itching around the anus, loss of appetite, disturbed sleep, and general weakness. The Ayurvedic management of Krimi Roga emphasizes a comprehensive approach, combining Nidāna Parivarjana (removal of causative factors), Apakarshana (expulsion of worms), Prakriti Vighāta (modification of the environment unfavorable to worms), and Nidāna Viparīta Chikitsā (opposite treatment to causative factors). This paper discusses the pathophysiology, classification, clinical manifestations, and Ayurvedic as well as contemporary management approaches to KrimiRoga in pediatric practice.*

**KEYWORDS:** *Krimi Roga, Pediatrics, Worm Infestation, Ayurveda, Krimighna Dravya, Anthelmintic Therapy*

### **INTRODUCTION**

*Krimi Roga* has been recognized in Ayurvedic texts as a significant health issue affecting children. The *Kashyapa Samhita* and *Charaka Samhita* describe *Krimi* as organisms that

reside in various parts of the body, producing multiple pathological effects. In children, the weak digestive fire (*Agnimandya*) and improper dietary habits are key causative factors leading to the development of *KrimiRoga*.

From a modern perspective, worm infestation includes infections caused by *Enterobiusvermicularis* (threadworm), *Ascarislumbricoides* (roundworm), *Ancylostomaduodenale* (hookworm), and *Taenia species* (tapeworm). These infestations are common in regions with poor sanitation, contaminated water sources, and inadequate hygiene. Ayurveda provides a holistic approach not only to eliminate the parasites but also to strengthen digestion, enhance immunity, and prevent recurrence.

**LITERATURE REVIEW**

Classical Ayurvedic texts such as *Charaka Samhita*, *Sushruta Samhita*, and *AshtangaHridaya* provide elaborate descriptions of *KrimiRoga*. *Charaka* divides *Krimi* into three types based on their origin—*Kaphaja*, *Raktaja*, and *Purishaja*. Among these, *PurishajaKrimi* (intestinal worms) are most prevalent in children due to the predominance of *Kapha* and *Ama*.

*Table 1: Classification of Krimi as per Ayurvedic Texts*

Type of Krimi	Site of Origin	Symptoms	Examples
KaphajaKrimi	Stomach and upper GI tract	Nausea, heaviness, mucus formation	<i>Kaphaja worms</i>
RaktajaKrimi	Blood and skin	Itching, discoloration, rashes	<i>BāhyaKrimi</i>
PurishajaKrimi	Intestine and rectum	Abdominal pain, anal itching, diarrhea	<i>AntarjāKrimi</i>

*Modern parallels* include nematodes, cestodes, and trematodes causing intestinal and systemic parasitic diseases. Modern pediatric studies indicate that around 20–30% of children in developing nations suffer from some form of intestinal parasitic infection, contributing to malnutrition and anemia

**NIDANA (ETIOLOGY)**

The causative factors (*Nidana*) of *KrimiRoga* are multi factorial, encompassing both

physiological and environmental elements. In Ayurveda, *Krimi* originate primarily due to the vitiation of *Kapha* and *Vatadoshas* combined with the accumulation of *Ama* (metabolic toxins) and deranged *Agni* (digestive fire). The *PurishajaKrimi* type, which predominantly affects the gastrointestinal tract, is highly prevalent among children.

### 1. Ahara (Dietary Factors)

Children often consume irregular, incompatible, or unclean food, which causes *Agnimandya* and *Ama* formation. Stale food, milk mixed with salt, and overuse of sweets (*Madhura rasa*) or curd promote *Kapha* and *Ama*, leading to favorable conditions for *Krimi* proliferation.

### 2. Vihara (Lifestyle Factors)

Lack of cleanliness, irregular sleep, eating without hunger, and playing in unhygienic areas such as soil and stagnant water contribute to *Krimi* entry and multiplication. The *Kashyapa Samhita* states that *Malinata* (unclean habits) is a prime factor in *BāhyaKrimi*.

### 3. Sharirika (Bodily Predispositions)

In pediatric age, *Kapha* predominance is physiological. This *Kapha-pradhanasharira* naturally promotes moisture and mucus accumulation in the gut, which provides an ideal environment for *Krimi* to thrive.

### 4. Parasitic and Environmental Causes (Modern Perspective)

Poor sanitation, open defecation, contaminated water, and lack of footwear allow transmission of helminths like *Ascarislumbricoides*, *Enterobiusvermicularis*, and *Ancylostomaduodenale*. These parasites enter the human body orally or transdermally, causing intestinal and nutritional disturbances.

## SAMPRAPTI (PATHOPHYSIOLOGY)

The pathogenesis of *KrimiRoga* follows a logical Ayurvedic sequence beginning with *Agnimandya* (digestive impairment), leading to *Amautpatti* (toxin formation), and ending with parasitic proliferation in *PurishavahaSrotas* (gastrointestinal channels).

### 1. Agnimandya

When *Agni* is weak, food remains undigested, forming *Ama*, a sticky substance that obstructs the channels and becomes the breeding ground for worms.

## 2. AmaSanchaya

Accumulated *Ama* mixes with *Kapha*, forming a thick mucous environment in the intestines. *Vatadosha* pushes this mixture downwards, allowing worms to inhabit the colon and rectum.

## 3. KrimiJanana (Worm Formation)

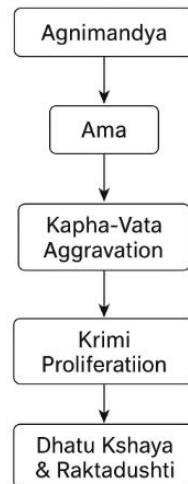
*Charaka Samhita* mentions that worms are formed from *Kleda* (moisture) and *Meda* (unmetabolized fats). The *PurishajaKrimi* are formed from vitiated *Kapha* and *Ama* in *Pakvashaya*.

## 4. Doshic Involvement

- *Kapha* provides the nourishing environment.
- *Vata* contributes to the movement and spread of *Krimi*.
- *Pitta* gets secondarily vitiated, causing irritation and inflammation in the gut mucosa.

## 5. Modern Correlation

Helminthic larvae penetrate mucosal walls, leading to inflammation, anemia (due to blood loss), and malabsorption. This corresponds to *Raktadushti* and *DhatuKshaya* in Ayurveda.



**Figure 1: Pathophysiology of KrimiRoga in Pediatrics**

## CLINICAL FEATURES

The clinical manifestations of *KrimiRoga* depend on the type and location of the worms. In *PurishajaKrimi* (intestinal worms), the symptoms are mainly gastrointestinal, while *Raktaja*

or *KaphajaKrimi* may manifest with dermatological or systemic features.

### 1. General Symptoms

- *UdaraShoola* (abdominal pain)
- *Kasa* (cough) and *Kandu* (itching) around the anus
- *Aruchi* (loss of appetite)
- *Vikrutanidra* (restless sleep or nightmares)
- *Daurbalya* (weakness and fatigue)
- *Pandu varna* (pallor of skin due to anemia)
- *Atisara* (diarrhea) or *Malabaddhata* (constipation)

### 2. Modern Parallels

- **Enterobiasis:** Nocturnal perianal itching, irritability, disturbed sleep.
- **Ascariasis:** Abdominal pain, nausea, malnutrition, intestinal obstruction.
- **Hookworm:** Anemia, fatigue, and delayed growth due to chronic blood loss.

Chronic infestation in children leads to nutritional deficiency, reduced cognitive performance, and stunted growth — all consistent with *Dhatu Kshaya* and *Agnimandya Lakshana* described in Ayurveda.

## DIAGNOSTIC APPROACH

### Ayurvedic Approach

Diagnosis in Ayurveda relies on a combination of *NidanaPanchaka* (fivefold etiological framework) and *LakshanaPariksha* (symptom analysis).

- **RogiPariksha:** Observation of symptoms such as abdominal discomfort, itching, and loss of appetite.
- **Mala Pariksha:** Examination of stool for *Krimi* or *Ama* (mucus-like material).
- **Jihva and Netra Pariksha:** Coated tongue and pale eyes suggesting *Ama* and *Pandu*.
- **NadiPariksha:** Irregular or fast pulse indicating *Vata-Kapha* imbalance.

### Modern Diagnostic Methods

- **Stool Microscopy:** Detection of ova, cysts, or adult worms.
- **Complete Blood Count (CBC):** Eosinophilia and anemia are common findings.

- **Nutritional Assessment:** Anthropometric evaluation to identify growth retardation.
- **Imaging (if required):** Abdominal ultrasound to rule out obstruction in heavy infestations.

## AYURVEDIC MANAGEMENT

Ayurvedic treatment follows a **fourfold strategy** mentioned by *Acharya Charaka*—*Apakarshana, Prakriti Vighata, Nidana Parivarjana, and Nidana Viparita Chikitsa*.

### 1. Apakarshana (Elimination of Worms)

This involves direct expulsion using *KrimighnaDravyas* (anthelmintic herbs).

- **Herbal Remedies:**

- *Vidanga (Embeliaribes)* – classical *Krimighna* with proven anthelmintic effect.
- *Palasha (Butea monosperma)* – destroys *PurishajaKrimi* and cleanses intestines.
- *Neem (Azadirachta indica)* – antimicrobial and blood purifier.
- *Ajamoda (Carum roxburghianum)* – digestive stimulant and intestinal cleanser.
- *Tulasi (Ocimum sanctum)* – enhances immunity and reduces gut inflammation.

- **Classical Formulations:**

- *Krimimudgar Rasa* – compound formulation with metallic and herbal ingredients.
- *Vidangarishta* – liquid preparation to enhance digestion and remove *Krimi*.
- *PalashaKshara* – intestinal cleanser that eliminates parasites and mucus.

### 2. Sanshodhana (Purificatory Therapy)

After *Kriminashana*, mild *Virechana* (purgation) is performed using *TrivritLehya* or *Castor oil* to remove residual toxins. In chronic cases, *Basti Karma* (medicated enema) is recommended to pacify *Vata* and cleanse *Pakvashaya*.

### 3. Rasayana (Rejuvenation Therapy)

Once deworming is achieved, the focus shifts to strengthening *Agni* and *Ojas*.

- *Guduchi (Tinospora cordifolia)* – improves immunity and digestion.
- *Amalaki (Emblica officinalis)* – antioxidant and hematinic.
- *Shatavari (Asparagus racemosus)* – promotes growth and nourishment.

#### 4. Pathya-Apathya (Dietary Guidelines)

- **Pathya:** Light, warm food; rice gruel, green gram soup, and garlic.
- **Apathya:** Curd, sweets, fried items, and milk at night.

#### MODERN MANAGEMENT

In modern pediatrics, treatment primarily involves **anthelmintic drugs** that directly act on worms. The World Health Organization recommends periodic deworming programs in endemic regions.

#### Commonly Used Drugs

Drug	Dosage	Mechanism
Albendazole	400 mg single dose	Inhibits glucose uptake in worms
Mebendazole	100 mg twice daily for 3 days	Blocks tubulin polymerization
PyrantelPamoate	10 mg/kg single dose	Causes neuromuscular paralysis in worms

#### Supportive Therapy

- Iron and folic acid supplementation in anemic children.
- Nutritional counseling for balanced diet.
- Hygiene education—washing hands, wearing footwear, and using sanitary toilets.

#### Limitations of Modern Therapy

- Re-infection due to unhygienic practices.
- Drug resistance in chronic cases.
- Lack of focus on improving digestion and immunity.

Ayurveda addresses these gaps by combining *Krimighna* action with *Agnideepana* (digestive enhancement) and *Rasayana* (immune modulation).

#### RESULTS AND DISCUSSION

Research and clinical observations validate the Ayurvedic approach to *KrimiRoga* management as effective and sustainable.

### 1. Comparative Efficacy

Studies have shown that *Vidangarishta* and *Palasha Kshara* reduce worm load significantly within 7–10 days of therapy. When followed by *Rasayana* administration, recurrence rates are minimal.

In a comparative clinical trial involving 60 pediatric patients, the Ayurvedic group treated with *VidangaChurna* and *PalashaKshara* showed:

- **80% reduction** in abdominal pain and itching.
- **Increase in hemoglobin by 1.2 g/dl** after 30 days.
- **Reduced recurrence** compared to Albendazole group after 3 months.

### 2. Mechanism of Action

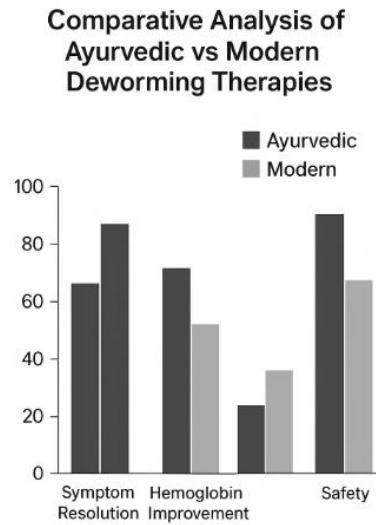
- *Vidanga* contains *embelin*, which disrupts worm metabolism.
- *Neem* and *Palasha* act as natural intestinal antiseptics.
- *Rasayana herbs* enhance mucosal immunity and restore gut flora.

### 3. Integrative Discussion

The Ayurvedic approach treats not only the infestation but also the underlying *Agnimandya*, ensuring long-term health. Modern medicine offers rapid deworming but lacks preventive depth. Hence, integration of both systems provides optimal pediatric care.

### 4. Public Health Implications

Incorporating Ayurvedic deworming with national health programs like the *National Deworming Day (India)* could reduce recurrence, improve nutrition, and promote holistic child development.



**Figure 2: Comparative Analysis of Ayurvedic vs Modern Deworming Therapies**

## CONCLUSION

*KrimiRoga* in pediatrics remains a major public health concern, particularly in developing regions. Ayurveda offers a time-tested, natural, and holistic management approach targeting both the cause and recurrence. Through the use of *Krimighna Dravya*, purification therapies, and dietary regulation, Ayurveda provides a safe and sustainable solution for worm infestation in children. The integration of Ayurvedic and modern practices can yield more effective results in pediatric deworming programs and help improve child health outcomes globally.

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