

A Review of *Erythrina Variegata* Leaf *Melluma* in the Management of *Kaphaja Krimi* (Tapeworms): A Comprehensive Analysis

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DOI: <https://doi.org/10.51244/IJRSI.2023.101015>

Received: 04 October 2023; Accepted: 07 October 2023; Published: 08 November 2023

ABSTRACT

One or more kinds of intestinal worms infect more than 50% of people worldwide. One of the earliest diseases affecting humans is tapeworms correlated to *Kaphaja Krimi* in Ayurveda. They still have a significant role in global morbidity and death today. *Erythrina variegata* leaf *Melluma* (dry curry or condiment) is a traditional remedy for intestinal worms and this review's objective was to investigate the effectiveness of this leaf *Melluma* in the management of worms. Information about worms was gleaned from *Ayurvedic* scriptures, contemporary texts and earlier research studies. Subsequently, a comprehensive survey of the literature was conducted for *Erythrina variegata* leaf *Melluma*, which was then scrutinized for their *Pancha Padārtha* (five elements of the herb) and pharmacological qualities related to the management of frontal sinusitis. Analysis of *Ayurvedic Pancha Padārtha* showed positive impact on derangement of *Dōsha* (body humors) involved in *Kaphaja Krimi* and the herbal formula's anti-helminthic properties, stemming from their alignment with anti-parasitic, anti-microbial, anti-inflammatory and analgesic properties. While the majority of studies have demonstrated the anti-helminthic effects of *Erythrina variegata*, reviewed articles have also highlighted additional qualities that alleviate the symptoms of worm infections. Based on the literature review and *Pancha Padārtha* analysis, the selected *Melluma* proves to be valuable in the management of worms.

Keywords– Anti-helmintic, *Erythrina variegata*, *Kaphaja Krimi*, Leaf *Melluma*, *Pancha Padārtha*, Worm infection

INTRODUCTION

The vast majority of cestodes or tapeworms (phylum Platyhelminthes, class Cestoda, the flatworms), live as parasites in the intestinal tracts of vertebrates as adults. They are bilaterally symmetric, often dorsoventrally flattened, and lack a body cavity, just like other flatworms. Each tapeworm is made up of a series of individuals, each of which has a full complement of reproductive organs, maturing in stages and sprouting from a body that is linked to the host tissue by a head or scolex. The three main parts of a tapeworm are the head (scolex), the germinal area, and the segmented body (strobila). A variety of holdfast organs, including rounded suckers, hooks, and elongated grooves, may be present on the scolex to help the worm hold its position in the stomach [1].

Transverse, circular and longitudinal muscles make up the body of a tapeworm, which also has a primitive neurological system made up of central ganglia in the scolex and paired longitudinal nerves that run the length of the worm.

Osmoregulatory canals or excretory canals are also present and they are connected by a network of transverse connecting tubules. The body covering or tegument of cestodes must operate as both a protective covering and a metabolically active layer through which nutrients can be absorbed and secretions and waste products may be transferred because cestodes lack a digestive system at any point of their life cycles. The

tegument, which often rests in close contact with the host intestine villar microtubules, is a syncytial anuclear surface layer coated in tiny projections known as microfiches that significantly increases the absorptive surface [1].

By depriving the victims of their hard-earned nutrition and weakening their body defence, *Krimis* (worms)—unsuspected and undiscovered villains—are to blame for exposing the victims to a variety of ailments [2]. Ancient *Ayurvedic* texts from the *Vedic* era commonly use the term “*Krimi*.” Microbiological relationships played a significant role in the aetiology of many diseases, and they are also a causal factor in several pathological conditions like weight loss, anaemia, vomiting, headaches, etc. Both internal and exterior *Krimi* exist. According to modern science, their route of transmission signs and symptoms are almost identical to those of worms and microorganisms. As much as they could they provided a description of the edifice and the name of *Krimi*. The bacteria and helminths discussed today are more or less comparable to the *Krimi* described in ancient texts. The definition of the word “*Krimi*” has been expanded. It describes a broad range of infectious diseases, both pathogenic and non-pathogenic [3].

Krimi is discussed in *Vruddhatraya* (major classical texts) and *Laghutraya* (minor classical texts) according to Ayurveda. *Charaka Samhitā*, *Susruta Samhitā* and *Ashtānga Hridaya Samhitā* are examples of *Vruddhatraya*. According to *Charaka Samhitā*, there are seven types of *Krimi* originating from *Kapha Dōsha* [4]. According to the *Susruta Samhitā*, *Kaphaja Krimi* has hairs on their body and head, blue patches on their body, and tails, white and thin (flat) in shape [5]. Those arising from *Kapha* reside in the *Amāshaya* (stomach), when increase in number they move everywhere are thin, long or minute, white or coppery colour and have seven types [6].

Sārangadhara Samhitā, *Bhāvaprakāsha* and *Mādhava Nidhāna* are all part of the *Laghutraya* According to *Mādhava Nidāna*, *Kaphaja Krimi* resemble thick leather tape are thin, long, small or round, white and coppery in colour [7]. *Bhāvamishara* (author of *Bhāvaprakāsha* text) describes six types of *Kaphaja Krimi* and it causes nausea, salivation, vomiting, indigestion, loss of taste, fever, distension and sneezing [8].

The current study is based on a traditional leaf *Melluma* that is used in worms and written over a traditional formula. The study critically analyzed the pharmacological activities and *Pancha Padārtha* in the management of *Kaphaja Krimi*.

AIMS & OBJECTIVES

The study was created to determine the anti-helminthic activity of the selected leaf *Melluma* in the management of *Kaphaja Krimi*.

RESEARCH METHODOLOGY

This research utilized a comprehensive methodology to assess the efficacy of the chosen *Ayurvedic* herbal formula for the management of *Kaphaja Krimi*. This methodology comprised two primary components. Firstly, a systematic literature review was conducted to collect data from both traditional *Ayurvedic* texts and contemporary medical literature.

A. Comprehensive Literature Review

In-depth examination of authentic *Ayurvedic* classics, including *Charaka Samhitā*, *Susruta Samhitā*, *Ashtānga Hridaya Samhitā*, *Mādhava Nidāna*, *Bhāvaprakāshaya* and the Ayurveda Pharmacopoeia, to establish the historical context and traditional understanding of *Kaphaja Krimi*. An extensive review of contemporary medical literature and a comprehensive literature search was carried out from March 2023 to September 2023, including encompassing textbooks, research articles, and official medical websites, to gain insights

into current perspectives on *Kaphaja Krimi*

B. Investigation of Herbal Components

Detailed study of the specific herbal component, *Erythrina variegata* (*Pāribhadra*), constituting the *Ayurvedic* Leaf *Melluma*. A thorough examination of the pharmacological properties of this herbs, with a particular emphasis on their proven anti-helminthic activity and other potential therapeutic qualities based on laboratory tests.

C. Limitations

We acknowledge certain limitations in our methodology,

The availability and interpretation of data from traditional *Ayurvedic* sources may vary, potentially affecting the comprehensiveness of our historical analysis. In the review of contemporary medical literature, we recognize the possibility of publication bias, where studies with positive results may be more likely to be published, potentially influencing our findings. Interpretations of *Ayurvedic* texts can vary among scholars and practitioners, which may introduce subjectivity into our analysis.

REVIEW OF MELLUMA

Leaf *Melluma* chosen from a traditional formula contain *Erythrina variegata*.

Erythrina variegata (*Pāribhadra*)

Medium-sized, spiky, deciduous *Erythrina variegata* trees which belong to Fabaceae Family typically reach heights of 6–9 m (rarely 28 m) with a diameter at breast height of 60 cm. Young stems and branches are heavily armoured with strong conical spines up to 8 mm long, but these spines eventually fall off after 2–4 years. Occasionally, a few spines do not break off and are kept with the corky bark. When young, the bark is paper-like and smooth. As it ages, it becomes thick, corky, and severely fissured.

Leaflets are smooth, shiny, longer than they are wide, 8-20 by 5-15 cm, oblong to acuminate and have an acutely pointed end. The leaves are trifoliolate, alternating, bright emerald green, on long petioles 6-15 cm, rachis 5-30 cm long, and prickly. Leaf rachis and petioles have spines. Stamens are upright terminal racemes that range in colour from brilliant pink to crimson and are 15-20 cm long. Fruit is a narrow-walled, constricted, cylindrical torulose pod that is green when immature and turns black and wrinkled as it ripens. Per pod, there are 1 to 8 smooth, rectangular, dark red to nearly black seeds.

Alkaloids like scoulerine, erysodin, erysovin, and the probable anxiolytic erythravine are among the chemical substances present in plants of this species. Parts used are stem bark, leaves and flower. *Pāribhadra* has *Katu* (pungent), *Tikta* (bitter) *Rasa*, *Laghu* (light) *Guna*, *Katu Vipāka*, *Ushna* (hot) *Virya* and balance *Kapha Vāta Dōsha*. Isoflavonoids with antibacterial and anthelmintic properties were identified from *Erythrina variegata*. Other distinctive pharmacological properties of *Erythrina variegata* include neuromuscular blocking, smooth muscle relaxant, CNS depressive, and hydrocholeretic, which are in line with the plant extracts' documented applications in the local medical system [9]. The *Erythrina* species exhibited strong anthelmintic activity [10]. The aqueous and ethanol extracts used in the polyherbal preparation demonstrated notable anthelmintic efficacy. As a result, the current study demonstrates that the ethanolic extract of *Erythrina variegata* exhibited notable anthelmintic activity, as compared to the aqueous extract, and that this preparation will efficiently kill the worms [11], [12], [13].

Different portions of *Erythrina variegata* have historically been used to treat convulsions, fever,

inflammation, bacterial infection, sleeplessness, cough, cuts, and wounds as sedatives, antiasthmatics, and antiepileptics [14], [15], [16]. In the current study, the phytochemicals and antibacterial activity of many extracts of *Erythrina variegata*, including water, methanol, ethanol, and hexane were assessed [17]. The acetic acid-induced writhing inhibition method was used to assess the peripheral analgesic efficacy of the methanolic extract of *Erythrina variegata* leaf (EVM). The plant extract's ability to stop mice from writhing was compared to the oral administration of aminopyrine at a dose of 50 mg/kg body weight, a common painkiller [18], [19], [20].

Numerous *Ayurvedic* texts mention *Pāribhadra* for a variety of ailments, including *Shōthahara* (anti-inflammation), *Krimighna* (antimicrobial), *Medōrōgahara* (anti-obesity), *Karnarōgahara* (ear illness), *Aruchi* (anorexia), and *Pramēha* (diabetes mellitus), among others. The herb is well renowned for its beneficial therapeutic properties. It contains isoflavonoids, which have antibacterial properties and can help prevent tooth cavities. Most of the texts include that *Pāribhadra* can be used for *Krimi Rōga* such as *Mādhava Dravyaguna*, *Madanpal Nighantu*, *Kaiydev Nighantu*, *Bhāvprakash Nighantu*, *Shaligram Nighantu* and *Priya Nighantu* [21]. As well as vermifuge and vermicide action [22].

RESULTS AND DISCUSSION

The *Krimi* or worms are described in various ways by various *Āchāryās*. *Charaka Samhitā Susruta Samhitā* and *Ashtānga Hridaya Samhitā* explain *Kaphaja Krimi* as well as *Mādava Nidāna* and *Bhāvaprakāsha* too.

Katu Tikta Rasa pacifies *Kapha Dōsha*, so can be used in *Kaphaja Krimi*. The Pungent taste balances *Kapha* because it is primarily composed of the fire and air elements, which make it hot, dry, light, and sharp – all qualities that balance *Kapha*, its affinity for the stomach delivers *Kapha* -pacifying qualities straight to this important *Kapha* site, it naturally warms the body, kindles the digestive fire, and stimulates metabolic function, it is extremely drying, which helps to counteract *Kapha* moist, watery and oily nature, its intense heat helps to melt and eliminate excess mucus, improve circulation, encourage sweating, and clear stagnation and toxins from the body, its stimulating and penetrating qualities open the internal channels, cleanse the blood and muscles, clarify the senses, thin the blood, dilate blood vessels, reduce cholesterol, break up clots, and support the elimination of excess fat, its upward movement and lightening energy counter *Kapha* heaviness and inertia, it inspires enthusiasm, excitement, curiosity, clarity, and expansiveness.

The Bitter taste balances *Kapha* because it is primarily composed of the air and ether elements and is very light and dry, it drains moisture from the body, dries the tissues, combats swelling tendencies alleviates congestion, and dries accumulated *Ama* (undigested food), tends to very scraping, which can help to clear accumulated *Kapha*, it is a digestive tonic, stimulating a healthy appetite, improving the sense of taste, kindling the digestive fire, enhancing the release of digestive enzymes, promoting peristalsis, and generally correcting any sluggishness in the GI tract, it cleanses and purifies the pancreas – an important *Kapha* site, it reduces fat, supporting healthy weight management, it imparts mental clarity, self-awareness, and a healthy detachment from worldly possessions. Also, *Laghu Guna*, *Katu Vipāka* and *Ushna Virya* pacify *Kapha* and so can be used to manage *Kaphaja Krimi*. *Pāribhadra* also Balances *Kapha Vāta Dōsha*.

The literature review indicates that *Pāribhadra* has anthelmintics, antihelminthics, anti-parasitic, anti-inflammatory and anti-microbial actions. Also reduce pain by analgesic, stun worms by vermifuge action and kill worms by vermicide action.

CONCLUSION

Worm infection as an important public health problem has been discussed in recent decades worldwide. *Erythrina variegates* are useful in the control of worms according to the review of the literature and the

Pancha Padārtha examination. Previous studies of pharmacological effects have revealed that it has strong anti-helminthic capabilities. There is an urgent need to reduce the prevalence of worm infections among people worldwide.

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