



MUSTAADI KWATH SYRUP- DRUG REVIEW

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ABSTRACT Intestinal parasitic infestation is the most common pediatric complaint worldwide in tropical and subtropical geographical areas. Recent global estimate indicates that more than a quarter of the world population is infected with one or more of most common type of parasites like Round worms (*Ascaris lumbricoids*), Hookworms and Whipworms. Chronic illness, malnutrition, and anemia are further manifestations of secondary effects of Intestinal worm infestation. In Chakardutta Acharya chakarpaani described *Mustaadi kwath* for *Krimi*. This article reviews various ingredient of *Mustaadi kwath* and their probable mode of action in *Krimi rog*.

KEYWORDS : *Mustaadi kwath, Krimi rog, Intestinal worm infestation*

INTRODUCTION

Krimi Roga is very common in children which mainly occur as intestinal infection. These *Krimi* (worms) possess ability to breed in human intestine with the help of food and blood. Worm infestation refers to the worms that live as parasites in the human body and are one of the main causes of diseases associated with health and nutrition problems beyond just gastrointestinal tract disturbances. Children aged 5-15 years makeup the group with highest worm burden, which is caused greatly due to the contamination of environment, poor sanitation and hygiene.

Mustaadi kwath described by acharya chakarpaani in chakardutta , *Krimi prakaran*. Contents of *Mustaadi kwath* are , *Musta, Madanf, Aakhuparni, Pippali, Shigru, Devdaaru, Vidang* . All seven herbs in *Mustaadi kwath* have anti helminthic, antibacterial properties.

MATERIAL AND METHODS

Electronic database, 'Google scholar', Pubmed, Scopus has been searched for relevant studies and review publications from 2011- 2023. The key words used for search are '*Mustaadi kwath* in *Pureeshaja Krimi*(Intestinal worm infestation). Abstracts and full texts of open access in English language were only considered.

मुस्ताखुपर्णी फल शिग्रुदारु क्वाथः सकृष्ण क्रिमी शत्रुकल्कः ।
मार्गद्वयेनापि चिखत्तान क्रिमिन् निहन्ति क्रिमिजाद्य रोगान् ॥

(चक्र . कृमि . ७ । ३)

Content	Botanical name	Ras	Guna	Viryā	Vipaka
<i>Musta</i> ²⁰	<i>Cyperus rotundus</i>	<i>Tikta, Katu, Kashaya</i>	<i>Laghu, Ruksha</i>	<i>Sita</i>	<i>Katu</i>
<i>Aakhuparni</i>	<i>Merremia emarginata</i>	<i>Tikta, Katu</i>	<i>Laghu, Ruksha, Tikshana</i>	<i>Ushna</i>	<i>Katu</i>
<i>Madanf</i> ²¹	<i>Randia spinosa</i> poir.	<i>Kashaya, Madhur, Tikta, Katu</i>	<i>Laghu, Ruksha</i>	<i>Ushna</i>	<i>Katu</i>
<i>Sahijan</i>	<i>Moringa oleifera</i>	<i>Katu, Tikta</i>	<i>Laghu, Ruks ha, Tikshana</i>	<i>Ushna</i>	<i>Katu</i>
<i>Devdaru</i> ²²	<i>Cedrus deodara</i>	<i>Tikta</i>	<i>Laghu, Snighdha</i>	<i>Ushna</i>	<i>Katu</i>
<i>Pippali</i> ²³	<i>Piper longum</i>	<i>Katu</i>	<i>Laghu, Snighd, Tikshana</i>	<i>Unush na, Sheeta</i>	<i>Madhur</i>
<i>Vayavidang</i>	<i>Embelia ribes</i>	<i>Katu, Kashaya</i>	<i>Laghu, Ruksha, Tikshana</i>	<i>Ushna</i>	<i>Katu</i>

1-MUSTAKA¹¹Latin name: *Cyperus rotundus*

Family: Cyperaceae

GANA: *Charaka-Triptighna, Trishnanigrhana, Lekhaneeya, Kandughna, Stanyashodhana*

Sushruta- Mustadi, Vachadi

Synonym- *Motha, Nagarmotha, Java grass, Tunga Mustalu, Nutgrass, Muthakach*

Pharmacodynamic Properties

Rasa- Tikta, Katu, Kashaya
Guna- Laghu, Rooksha
Veerya- Sheeta
Vipaka- Katu
Dosha karma- Kaphapitta shamaka

Chemical Constituents:

The major chemical constituents of *Musta* are 4 α , 5 α , oxidoeudesm-11-en-3 α -ol, Cyperene-1, Cyperene-2, β -selinene, cyperenone, α -cyperone. The other chemical compounds include cyperenol, cyperolone, eugenol, cyperol, isocyperol, α -and β -rotunol, sugetriol triacetate, rotundenol, rotundene, β -sitosterol, pinene, alcohol-isocyperol, linolenic, linoleic, oleic, myristic and stearic acids and glycerol.

Pharmacotherapeutic actions-

Anti Inflammatory, anti-microbial, anti-allergic, Hepato-protective, antioxidant

Research evidence¹²

The ovicidal and larvicidal efficacy of essential oils extracted from the tubers of *Cyperus giganteus* and *Cyperus rotundus* Linn. was studied on eggs and fourth instar larvae of *Aedes albopictus*.

2-AKHUPARNIKA¹³

Latin name – *Merremia emarginata* Burm f.
Family – *Convolvulaceae*
Synonyms – *Musikakarni, Bhudaribhv, Musikahvaya, Undurukarnika*
Hindi – *Musakani*
English – *Dordar*
Gana – Krimighna Dasaimani (Ch.), Sursadigana (Su.), Surasadigana (A.H.)

Pharmacodynamics:

Rasa – Tikta, katu
Guna – Laghu, Ruksha, Tiksana
Viryā – Shita
Vipaka – Katu
Doshaghna – Kapha-Vatahara
Karma – Kapha-Vata Hara, Rechana.

Chemical Composition: caffeic, p- coumaric, ferulic & sinapic acid esters from seeds

Pharmacological activities:

Alcoholic extract of whole plant showed a general depressant action in rats. The extract also had spasmolytic action on guinea pig ileum. The plant *Merremia emarginata* (Burm.f.) Hallier f. belongs to *Convolvulaceae* family. In traditional medicinal system, different

parts of *M. emarginata* have been mentioned to be therapeutically used as deobstruent, diuretic, for cough, headache, neuralgia and rheumatism. In the present study, biological activities of different solvent extracts isolated from *M. emarginata* were tested. Hexane (IA), ethyl acetate (IB), methanol (IC) and aqueous methanol (25%) (ID) extracts of *M. emarginata* were examined. Methanol and hexane extracts exhibited α -amylase inhibitory activity with IC₅₀ of 104.5 and 133.4 μ g mL⁻¹, respectively. Methanol extract of this plant might be use full for antioxidant and anti-obesity activities with minimal toxicity.

3-MADANPHAL^[4]

Latin name: *Randia spinosa*

Family: Rubiaceae

GANA: *Charaka-vaman, jalini*

Sushruta-Urdhavbhaghar, Aaragvadhadi, Mushakaadi

Synonym – *Madan, Chardan, Pindi, Shalyak, Vishpushpak*

Hindi name- Mainphal

English name- emetic nut

Pharmacodynamic Properties

Rasa- Tikta, Katu, Kashaya, madhur

Guna- Laghu, Rooksha

Veerya- Ushna

Vipaka- Katu

Dosha karma- Kaphapitta shamaka

Chemical Constituents: Saponin, tritprin,

Therapeutic uses: *Krimi, Gulm, Udarararoga, Jwar, Kaphapradhana.*

Pharmacotherapeutic actions– Best *vamaka*.

Research evidence–

C. spinosa, known as Madana in Sanskrit, Madanphal in Nepali, and emetic nut or mountain pomegranate in English. anthelmintic activity of the fruit extract of *C. spinosa* was studied in *Pheretima posthuma*. Extract of *C. spinosa* (200 mg/mL) was tested against worms for its ability to paralyze and kill the worms. The study showed that the ethanolic extract reveals comparable results similar to albendazole (10 mg/mL), a standard drug as a positive control.^[5]

4-AKSHIVA (SHIGRU)^[6]

Latin name – *Moringa oleifera* Lamk.

Family – Moringaceae

Gana – *Krimighna, Swedopaga, Shirovirechanopaga, Katuka*

Skandha (Cha.) Varunadi, Shirovirechana (Su.), Varunadi (A.H.)

Synonyms – *Akchiva, Tikshnagandha, Mocaka, Sobhanjana, Bahupatra.*

English – Drumstick, Indian horse radish tree

Hindi – *Sahijana*

Part used – Seed

Pharmacodynamics

Rasa – Katu, Tikta

Guna – Laghu, Teekshna, Ruksha

Veerya – Ushna

Vipaka – Katu

Doshaghna – Kapha-Vatahara

Karma – Kapha-Vatahara, Shukrala, Grahi, Dipan, Hridaya, Krimighana, Chakshusya.

Chemical constituent: Asarone, B-asarone, calamenol, calamine, eugenol, Methyl eugenol.

Pharmacological activities:

The defatted methanolic extract of the stem bark exhibited antibacterial and antifungal activities. Aqueous extract of stem bark showed anti implantation activity in female rat further, the extract showed protective effects against CCl₄-and rifampicin-induced hepatotoxicity, while problem ether extract exhibited protective effect against paracetamol-induced hepatotoxicity in rats. Caffeic acid and fumaric acid, isolated from the aqueous extract of the stem bark showed in vitro hepatoprotective activities

Research evidence–

- An in-vitro study evaluated the effectiveness of macerated and infused aqueous extracts of *Moringa oleifera* as well as ethanolic

extracts against fresh eggs, embryonated eggs, and L1 and L2 larvae of *Haemonchus contortus*.

- The outcomes showed that at concentrations of 3.75 mg/mL and 5 mg/mL, respectively, ethanolic leaf extract of *Moringa oleifera* was the most effective on eggs, inhibiting 60.3% 8.2% and 92.8% 6.2% eggs embryonation.^[7]

5-DEV DARU^[8]

Latin name: *Cedrus deodara*

Family: Pinaceae

GANA: *Charak- stnyashodhan, anuvasnopag, katuskandh*

Sushruta- vaatshanshaman

Synonym – *Bhadraaru, Surbhuruh,*

Hindi name- *Devdar*

English name- *Deodar*

Pharmacodynamic Properties

Rasa- Tikta,

Guna- Laghu, Snigdha

Virya- Ushna

Vipaka- Katu

Dosha karma- Kaphavatthar

Chemical Constituents:

Sesquiterpene, Dihydromyricetin, cedrine, deodorin and cedrinoxide, kaempferol glucoside, polyphenolic lignoids, deoardione, limonenecarboxylic acid, cedeodarin, dihydromyricetin, cedrinoside

Pharmacotherapeutic actions–

Spasmolytic, antiinflammatory, antibacterial, antifertility, antifungal, larvicidal, insecticidal, antiviral, antiseptic, antidiabetic, antipassive cutaneous activity, immunomodulatory, analgesic, juvenile hormone activity.

6-PIPPALI^[9]

Latin name: *Piper longum* Linn.

Family: Piperaceae

Synonyms: *Pippali, Krishna, Magadhi, Kana, Chopal,*

Ushna, Upkulya Shaundi, Vaidehi, Tikshna, Tandula.

GANA: *Charaka- Kasahara, Triptighna, Deepanaiya, Shulaprashamana, Shirovirechana, Hikkaniyrahana*

Sushruta- Pippalyadigana, Shirovirechana

Pharmacodynamic Properties:

Rasa- katu

Guna- Laghu, Snigdha, Tikshana

Virya- Umushna

Vipaka- Madhur

Dosha karma- Kaphavatthar

Active Constituents:

Essential oils (0.7%), Piperine (4-5%), Piplartine, Alkaloids, dihydro stigmaterol sesamin, and a new sterol, pilaster, a waxy alkaloid N-isobutyl deca-trans-2-trans-4-dienamide and a terpenoid substance.

Pharmacological actions:

Immuno-stimulatory, hepato-protective, antibacterial, ant inflammatory Rasayan, Appetizer. Insecticidal, Antimalarial, CNS stimulant, Antitubercular, Antispasmodic, Cough suppressor.

Research evidence –

- Piper longum* contains piperin as main phytoconstituents. Bioavailability enhancer and larvicidal activity. The effect would be due to presence of alkaloids which may suppress the transfer of sucrose from the stomach to the small intestine together with its antioxidant effect which is capable of reducing the nitrate generation which could interfere in local homeostasis which is essential for the development of helminths. The possible mechanism of action of tannins may be interfere with energy generation by uncoupling oxidative phosphorylation, or may interfere with glycoprotein of cell surface, or can bind to free proteins in the gastrointestinal tract of host animal or glycoprotein on the cuticle of the parasite and cause death.^[10]

5. VIDANGA:^[11]

Latin Name – *Embelia ribes* Burn f.

Family – Myrsinaceae

Hindi – *Vayavidanga, Bhabhiranga*

Synonym – *Krimighna, Chitrtandula, Amogha, Vella, Tandula, Jantuhantri, Gahvara.*

Gana – Krimighna, Kusthaghna, Triptighna (Ch.), Surasadi, Pippalyadi (Su.), Sursadi, Pippalyadi (A.H.)

Part Used – Fruit

Pharmacodynamics:

Rasa – Katu, Kashaya

Guna – Laghu, Ruksha, Tikshna

Virya – Ushna

Vipaka – Katu

Karma – Vishaghna, Krimighana, Dipana

Parts used – Fruit

Chemical Constitution:

Embelin, christembin, homoemelin, homorapanone, vilangini,.

Pharmacological activities: Benzene and ethanol extract significantly increased the glycogen, protein and non-nitrogen contents in the uterus of the normal and ovariectomized rats. Embelin was found to enhance the absorptive and digestive function of rat intestine. Major therapeutic activities contraceptive, anthelmintic.

Research Evidence-

- Embelin from *Emblicaribes* at the concentrations of 2, 4, 6, 8 and 10mg/ml showed profound and better anthelmintic activity against *Pheretima posthuman* than albendazole.^[12]
- Ethanol extract of seeds of *Embelia ribes* in the concentrations of 10–200µg/mL exhibited potent anthelmintic activity against roundworm *Rhabditis pseudoelongata*.^[13]
- Vidangadi churna-an Ayurvedic formulation containing *Embelia ribes*, *Hordeum vulgare*, *Mallotus philippinensis*, *Terminalia chebula* showed potent in vitro anthelmintic activity against adult earthworm *Pheretima posthuman*.^[14]
- Aqueous extract of *Embelia ribes* fruit showed in the concentrations of 3% and 5% showed potent anthelmintic activity against Indian Adult earth worm *Pheretima posthuman*.^[15]

DISCUSSION

Drugs like *Vidang*, *Aakhuparni* and *Sahijan* are potent wormicidal described in ayurveda. In *Mustaadi kwath* drugs (*Musta*, *Pippali*, *Devdaaru*) have *katu*, *tikat*, *kashay ras* and *Ushna virya* which are opposite quality of *kaph* and *purish* so that they help in *prakritivighat* of *Krimi*. *Deepan-pachan* properties of drugs (*Musta* and *Devdaaru*) give symptomatic relief in *Agnimadhya*. Essential oil of *Musta* exhibited anthelmintic activity and methanol extract was found to significantly suppress the frequency of the diarrheal episodes. *Madanphal* is best *vamak* in nature. It has ethanol extract which larvicidal in nature. *Pippali* contains piperin which act larvicidal activity. All drugs are wormicidal and larvicidal in nature, and have antibacterial, anthelmintic property.

CONCLUSION

Worm infestations are present in people of all ages but children are much more prone to it as they are at the stage of beginners to learn how to cope with these parasitic enemies. In last few years use of herbal medicine in treatment was increasing because of side effects associated with modern medication. *Apakarsana, Prakriti Vighaat, Nidana Parivarjana* is main line of treatment in Ayurveda for *Krimi roga*. All drugs of *Mustaadi kwath* have *katu*, *Tikta*, *Kashaya ras* which are responsible for *prakriti vighaat* of *Krimi*. *Mustaadi kwath* should be given in worm infestation because all drugs of *Mustaadi kwath* has Anti helminthic effect. Hence it can be concluded that *Mustaadi kwath* syrup may give better results in treatment of intestinal worm infestation.

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