



## Clinical Research

## Clinical study on the effect of decoction of *Pavetta indica* Linn. in treatment of *Purishaja Krimi* with special reference to *Enterobius vermicularis* infestation

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### Abstract

*Pavetta indica* Linn. (Family: *Rubiaceae*; Sanskrit name: *Papata*) is 2-5 m tall, shrub or small tree with opposite branches and grows in the Asia - Pacific region including Sri Lanka. *Purishaja Krimi* is one of the worm infestations described in Ayurveda. *Enterobius vermicularis* is among the most common of worms affecting children and adults. *E. vermicularis* is considered as one type of *Purishaja Krimi*. Sri Lankan traditional and ayurvedic physicians use *P. indica* to treat different ailments including *Purishaja Krimi* (*E. vermicularis*) infestations successfully. Since no scientific studies have been undertaken to study these effects so far, the present clinical study was carried out to evaluate the effect of *P. indica* in treatment of *E. vermicularis* infestation. Fifty patients between age of 5 and 12 years (Group A and B) and 50 patients between 13 and 65 years (Group C and D) with symptoms of *E. vermicularis* infestations such as itching in the anal region, impaired appetite, abdominal pain, eructation, diarrhea or constipation and presence of ova in stools were selected. Two decoction of the trail drug with different concentration was prepared. Group A and Group B were treated with 60 ml of decoction 1 and 60 ml of placebo respectively, twice daily for 14 days. Group C and Group D were treated with 120 ml of decoction 2 and 120 ml of placebo respectively, twice daily for 14 days. Groups A and C showed complete or partial reduction of symptoms, that is; itching in the anal region, impaired appetite, abdominal pain, eructation, diarrhea and also ova of *E. vermicularis* were absent in stools after treatment with *P. indica*. Decoction of *P. indica* can be recommended as an effective treatment for *Purishaja Krimi* (*E. vermicularis* infestation).

**Key words:** *Enterobius vermicularis*, *Pavetta indica*, *Purishaja Krimi*, thread worm

### Introduction

*Krimi Roga* (worm infestation) is one of the diseases mentioned in ancient ayurvedic and Sri Lankan traditional medical books. A vast description is given in those books on different types of worms, etiology, clinical features of worm infestation and their management. *Purishaja Krimi* is one type of worms described in Ayurveda. The signs and symptoms of *Purishaja Krimi Roga* are eructation, impaired appetite, pain in the abdomen and itching in the anal region, emaciation and diarrhea.<sup>[1]</sup> *Purishaja Krimi Roga* can be correlated with *Enterobius vermicularis* infestation.

*E. vermicularis*, commonly referred to as the thread worm or

pinworm is a nematode with the largest geographical distribution of any helminthes. Humans are the only known host and about 209 million persons world-wide are infected. More than 30% of children world-wide; most commonly those of school age, are infected. Some people may have an infestation without having any symptoms. When symptoms are present, the most common one is that of itching around the rectum. This itching is usually worse at night and is caused by worms migrating to the area around the rectum to lay their eggs. When a person scratches the itchy area, eczema or a bacterial infection around the rectum can result. In females, thread worm infestation can spread to the vagina and cause a vaginal discharge.<sup>[2]</sup>

*Pavetta indica* L. (Family: *Rubiaceae*; Sanskrit name: *Papata*; Sinhala name: *Pawatta*) is nearly a smooth or somewhat hairy shrub growing 2-5 m or more in height. It is widely distributed from India and the North-Western Himalayas, Sri Lanka, Andaman Islands to Southern China and southwards throughout Malaysia to Northern Australia.<sup>[3,4]</sup> It is commonly used in treatment of cough, hematemesis, hemorrhoids and worm infestation by

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Sri Lankan traditional and ayurveda physicians but no known scientific studies have been carried out so far. The present study was carried out to scientifically evaluate the efficacy of decoction of *P. indica* in *Purishaja Krimi* (*E. vermicularis* infestation).

## Materials and Methods

### Selection of patients

Patients between 05 and 65 years of age, from both sexes, suffering from *Purishaja Krimi* (infestation of *E. vermicularis*) were selected from those who attended the mobile clinic, Lollupitiya, Ratnapura conducted by Ayurveda Hospital, Ratnapura, Sri Lanka. The patients having such symptoms as *Udgara* (eructation); *Agnimandya* (impaired appetite); *Shoola* (pain in abdomen); *Agnisadana* (poor digestion); *Gudakandu* (itching in the anal region); *Vidbheda* (loose stool); *Vishtambha* (constipation); *Nihshwasa Vidgandha* (bad breath having fecal odor); *Parushya* (dryness of the skin); *Pandutha* (whitish-yellow discoloration of the skin); *Karshya* (emaciation) were selected. Detailed examination of the patients was carried out. In adults, the patients who are over 65 years and those who are suffering from recurrent attacks of bronchial asthma, anemia, hypertension and diabetes mellitus were excluded from this research. In children, the patients who are below 5 years, underweight, suffering from eczema and cough, were excluded from this study.

### Clinical study

Selected patients were divided into two groups according to their age; that is, children between 05 and 12 years and patients above 13-65 years. Each group of patients was again randomly divided into two sub groups as trial and control. They were then named as Group: A, B, C, D and were treated in the following manner.

Group A consisted of 25 patients between 05 and 12 years and were treated with 60 ml of decoction 1 (decoction of *P. indica* prepared for children) twice a day after meals for 7 days. Group B consisted of 5 patients between 05 and 12 years and treated with 60 ml of placebo, twice a day after meals for 7 days.

Group C consisted of 25 patients between 13-65 years and treated with 120 ml of decoction 2 (decoction of *P. indica* for adults), twice a day after meals for 7 days. Group D consisted of 25 patients between 13-65 years and was treated with 120 ml of placebo, twice a day after meals for 7 days. Stools test for ova was carried out pre- and post-treatment. The patients in all four groups continued the treatment as prescribed without drop outs

Patients of all the groups were advised to keep the finger nails short and clean, avoid scratching the infected area around the anus, wash hands before meals and after using the toilet, to keep hands and fingers away from the nose and mouth unless they are freshly washed, to wash all bed linen and clothing daily during the treatment period.

### Preparation of decoction 1 (decoction of *P. indica* for children between 05 and 12 years)

The 60 g of fresh leaves of *P. indica* was taken and cut into small pieces, then 960 ml of water was added and boiled down to 120 ml.

### Preparation of decoction 2 (decoction of *P. indica* for adults)

The 120 g of fresh leaves of *P. indica* was taken and cut into small pieces, then 1920 ml of water was added and boiled down to 240 ml.

### Preparation of placebo (children and adults)

The placebo was prepared by adding brown, permitted food coloring to boiled and cooled water.

### Clinical assessment and statistical analysis

The therapeutic effect was evaluated through symptomatic relief of the patients using a scoring pattern and statistical comparisons were made using Mann-Whitney U test using the statistical package Minitab 12.1 for windows.  $P < 0.05$  was considered as a significant effect.

## Observations and Results

In the present study, it was observed that most of patients

**Table 1: Percentages of symptomatic relief during treatment, with decoction 1 (decoction of *Pavetta indica* for children) and placebo in children (05-12 years)**

Symptoms	Control group (%)				Treated group (%)			
	Completely relived	Partially relived	Unchanged	Aggravated	Completely relived	Partially relived	Unchanged	Aggravated
<i>Udara Shoola</i> (pain in abdomen)	00.0	05.2	79.8	15.0	59.1	22.7	19.2	00.0
<i>Agni Mandya</i> (impaired appetite)	00.0	08.4	82.6	10.0	52.4	33.3	14.3	00.0
<i>Guda Kandu</i> (itching in anal region)	00.0	04.0	70.5	25.5	66.7	19.0	14.3	00.0
<i>Udgara</i> (eructation)	00.0	22.6	66.9	10.5	61.5	07.7	15.4	15.4
<i>Vidbheda</i> (diarrhoea)	00.0	11.6	78.5	09.9	70.0	00.0	20.0	10.0
<i>Vishtambha</i> (constipation)	00.0	04.0	50.8	45.2	64.3	00.0	21.4	14.3
<i>Nihshwasa Vid Gandha</i> (bad breath having fecal odor)	00.0	00.0	85.2	14.8	56.3	12.5	18.7	12.5
<i>Parushya</i> (dryness of the skin)	00.0	00.0	82.4	17.6	37.4	31.3	31.3	00.0
<i>Pandutha</i> (whitish-yellow discoloration of the skin)	00.0	04.0	96.0	00.0	61.9	23.8	09.5	04.8
<i>Karshya</i> (emaciation)	00.0	00.0	85.4	14.6	36.3	09.1	54.6	00.0

suffering from *Purishaja Krimi* (*E. vermicularis* infestation) had the symptoms such as itching in the anal region (80%), impaired appetite (75%), abdominal pain (60%), eructations (40%), diarrhea (38%) or constipation (20%), bad breath having fecal odor (20%) dryness (30%) and discoloration of the skin (30%). The therapeutic effect was evaluated through symptomatic relief and the results obtained in children are given in Tables 1 and 2 and in adults are given in Tables 3 and 4. Laboratory investigations showed ova of *E. vermicularis* were present in the stools in the all the groups prior to the treatment. In Groups A and C ova were absent in stools, after treating with decoction of *P. indica* for 7 days.

## Discussion

*P. indica* is used in treatment of cough, hemorrhoids, worm

infestations and hematemesis by Sri Lankan traditional physicians. *P. indica* has the properties of *Rasa: Tikta, Kashayarasa, Laghu, Ruksha* and *Tikshmaguna, Katuvipaka and Sheetaveerya*. Due to these properties *P. indica* acts as a *Kaphaghadravya* (ingredient which reduces *Kapha Dosha*). According to principals of Ayurveda, predominance of *Kapha Dosha*, supports a favorable environment for the reproduction, growth and propagation of worms in the human body. Any ingredient that reduces *Kapha Dosha*, makes the environment unfriendly for the survival of worms. This will cause the worms to die out. This action will lead to reduction of the symptoms of *E. vermicularis* infestation and to make stools free of ova. Based on this chain of actions, it can be proposed that *P. indica* acts as a reducer of *Kapha Dosha* which in turn reduces the growth and reproduction of worms including *E. vermicularis*.

**Table 2: Statistical results on Symptomatic relief during treatment, with decoction 1 (decoction of *Pavetta indica* for children) and placebo in children (05-12 years) (mean±SEM)**

Symptoms	Control group mean±SE		Treated group mean±SE	
	BT	AT	BT	AT
<i>Udara Shoola</i> (pain in abdomen)	2.76±0.25	2.98±0.37	2.18±0.18	0.41±0.13*
<i>Agni Mandya</i> (impaired appetite)	2.04±0.28	1.94±0.16	1.82±0.22	0.68±0.18*
<i>Guda Kandu</i> (itching in anal region)	1.84±0.36	1.78±0.46	1.96±0.203	0.41±0.13*
<i>Udgara</i> (eructation)	1.02±0.24	1.18±0.16	0.55±0.18	0.41±0.13
<i>Vidbheda</i> (diarrhea)	0.88±0.11	0.72±0.18	0.50±0.16	0.14±0.10*
<i>Vishtambha</i> (constipation)	0.78±0.20	0.76±0.32	0.68±0.15	0.23±0.09*
<i>Nihshwasa Vid Gandha</i> (bad breath having fecal odor)	1.21±0.11	1.40±0.21	0.91±0.16	0.31±0.10*
<i>Parushya</i> (dryness of the skin)	0.88±0.32	1.00±0.30	1.36±0.26	0.50±0.14*
<i>Pandutha</i> (whitish-yellow discoloration of the skin)	1.26±0.18	1.34±0.21	1.46±0.17	0.46±0.13*
<i>Karshya</i> (emaciation)	0.68±0.10	0.72±0.11	0.41±0.14	0.31±0.12

P<0.05 significant, BT: Before treatment AT: After treatment, SE: Standard error, SEM: Standard error mean

**Table 3: Percentages of symptomatic relief during treatment, with decoction 2 (decoction of *Pavetta indica* for adults) and placebo in adults**

Symptoms	Control group (%)				Treated group (%)			
	Completely relived	Partially relived	Unchanged	Aggravated	Completely relived	Partially relived	Unchanged	Aggravated
<i>Udara Shoola</i> (pain in abdomen)	00.0	08.7	65.9	25.4	57.2	39.2	03.6	00.0
<i>Agni Mandya</i> (impaired appetite)	00.0	12.1	65.3	22.6	39.2	52.2	04.3	04.3
<i>Guda Kandu</i> (itching in anal region)	00.0	02.5	29.5	68.0	65.2	22.2	00.0	02.6
<i>Udgara</i> (eructation)	00.0	00.0	91.5	08.5	36.0	48.0	12.0	04.0
<i>Vidbheda</i> (diarrhea)	00.0	12.8	84.9	02.3	41.7	29.2	16.6	12.5
<i>Vishtambha</i> (constipation)	00.0	15.7	75.4	08.9	57.7	23.0	15.5	03.8
<i>Nihshwasa Vid Gandha</i> (bad breath having fecal odor)	00.0	00.0	89.5	10.5	23.1	57.7	15.4	03.8
<i>Parushya</i> (dryness of the skin)	00.0	00.0	100.0	00.0	30.0	37.0	22.0	11.0
<i>Pandutha</i> (whitish-yellow discoloration of the skin)	00.0	00.0	94.8	05.2	55.5	33.4	07.4	03.7
<i>Karshya</i> (emaciation)	00.0	00.0	98.2	01.8	16.7	30.8	52.5	00.0

**Table 4: Statistical results on Symptomatic relief during treatment, with decoction 2 (decoction of *Pavetta indica* for adults) and placebo in adults (mean±SEM)**

Symptoms	Control group mean±SE		Treated group mean±SE	
	BT	AT	BT	AT
<i>Udara Shoola</i> (pain in abdomen)	3.12±0.55	3.04±0.24	3.16±0.18	0.57±0.19*
<i>Agni Mandya</i> (impaired appetite)	2.04±0.14	2.14±0.22	1.82±0.21	0.64±0.16*
<i>Guda Kandu</i> (itching in anal region)	2.75±0.20	2.54±0.30	2.96±0.18	0.57±0.16*
<i>Udgara</i> (eructation)	1.40±0.14	1.45±0.34	1.53±0.20	0.75±0.15*
<i>Vidbheda</i> (diarrhea)	1.78±0.56	1.94±0.36	1.36±0.19	0.54±0.12*
<i>Vishtambha</i> (constipation)	2.05±0.21	1.94±0.34	1.54±0.17	0.46±0.14*
<i>Nihshwasa Vid Gandha</i> (bad breath having fecal odor)	2.14±0.58	2.22±0.32	1.93±0.18	0.93±0.15*
<i>Parushya</i> (dryness of the skin)	1.34±0.20	1.43±0.15	1.89±0.15	1.00±0.18*
<i>Pandutha</i> (whitish-yellow discoloration of the skin)	1.86±0.53	1.64±0.42	2.11±0.16	0.68±0.19*
<i>Karshya</i> (emaciation)	1.28±0.24	1.32±0.34	1.39±0.20	1.21±0.18

P<0.05 significant, BT: Before treatment, AT: After treatment, SE: Standard error

## Conclusion

Most patients who were treated with decoction of *P. indica* had complete or partial relief from the symptoms which occur in thread worm infestation; especially itching in the anal region, impaired appetite and pain in the abdomen. According to this study, ova in stools disappear after the treatment of decoction of *P. indica*. It is concluded that decoction of *P. indica* is a traditional decoction, which can be very successfully used in treatment of *Purishaja Krimi* (*E. vermicularis* infestation) in children and adults.

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## हिन्दी सारांश

### *Pavetta indica* का पुरीषज कृमि पर चिकित्सकिय प्रभाव

एडिरिवीरा, राजपक्षा, रथनायका, प्रेमकीर्ति, प्रेमथिलका

आयुर्वेद मे कृमि शीर्षक के अंतर्गत कृमियों के पर्याक्रमण का वर्णन आता है । Enterobius vermicularis एक प्रकार की पुरीषज कृमि है जो वयस्को एवं बालको को समान्यतः प्रभावित करता है । श्रीलंका के पारम्परिक एवं आयुर्वेद के वैद्य Pavetta indica का प्रयोग पुरीषज कृमि के साथ अन्य व्याधियो के उपचार मे सफलता पूर्वक करते है । अब तक कोई भी वैज्ञानिक अध्ययन इस प्रभाव को दर्शाने हेतु नहीं किया गया, वर्तमान कार्य मे इसी विषय पर चिकित्सकिय अध्ययन किया गया था । ५० रुग्ण जो कि ५ से १२ वर्ष (ग्रुप A एवं ग्रुप B) और ५० रुग्ण जो कि १३ से ६५ वर्ष (ग्रुप C एवं ग्रुप D) के बीच थे उनमें E. vermicularis पर्याक्रमण के लक्षण पाये गये । ग्रुप A को 60 ml कषाय एवं ग्रुप B को 60 ml कूटभेषज (Pavetta indica) दिन मे २ बार, १४ दिनो तक दिया गया । ग्रुप A एवं ग्रुप C मे P indica की चिकित्सा के बाद लक्षणो मे पूर्ण एवं आंशिक कमी देखी गई । अतः E. vermicularis के पर्याक्रमण के विशेष संदर्भ के साथ P. indica के कषाय की संस्तुति कृमि पर्याक्रमण की प्रभावकारी चिकित्सा के रूप मे की जा सकती है ।