ABSTRACT:

According to World Health Organization (WHO) globally there are 1221-1472 million cases of *Ascariasis*, and 740-1300 million cases of *Necatoramericanus* infestation. In Āyurveda many herbo-mineral preparations were used, a potent, safe, minimal dose preparation needed in the present era. *Krimimudgararasa* is mentioned in many classics as effective remedy. This study to be comprised of scientific documentation of the clinical efficacy of *Krimimudgararasa in Udarakrimi*, for duration of 7 days. Clinical study was conducted in 30 children, whose stool examination showed presence of ova/cyst. It was open label study with pre and post test design where in children were assigned to single group. 125mg of *Krimimudgararasa* was administered mixing with honey as *anupana* once daily for a period of 7 days. Initial assessment was done before starting the study followed by review on 4th, 8th and follow up assessment on 30th day. The progress and response to the treatment were observed with subjective and objective parameters. The data obtained were assessed by applying statistical scoring system The study illustrated remarkable efficacy of the *Krimimudgararasa in Udarakrimi* with a highly significant improvement in most of the assessment criteria in the duration of 7 days. Absence of pin worms was noted in stool examination in 7 days and markable deduction in the number of ova/cyst of round worm and hook worm were noted, hundred percentage reliefs was noted in *Gudakaṇḍu* in 7 days. The medication showed no untoward effects during the trial. Kajjali synergistically acts with the herbal ingredients, makes the preparation effective in minimal dose.

KEY WORDS: Herbo-mineral Krimimudgararasa, Udarakrimi, Anupana, Gudakaṇḍu
INTRODUCTION
The parasite derives all benefits like food and shelter from association and the host may either not be harmed or may suffer the consequences of this association, a parasite disease. Krimiroga is one of the most common diseases found in children. Intestinal parasites have been considered a major public health problem throughout the world [WHO, 1967, Wahdan, 1983, McLaren, 1984]. In our country this problem is more important because it adversely affects the nutritional status of a person but neglected due to poor socio-economic status. It affects the children more frequently than adults (CCRAS, 1987). Number of incidence runs into millions and in tropical-countries like ours, percentage of affected cases is estimated to exceed 80% as large number of cases affected with Krimiroga is asymptomatic. Krimis are the unsuspected and undetected villains responsible for exposing the victims to a large number of diseases by robbing them of their hard earned nutrients, thus lowering their body defense. Hookworm, sucks 0.4 ml of blood per worm per day, thereby cause anemia and makes them physically weak, and remains unhealthy throughout their life span. Ascarial obstructive jaundice, Ascarial intestinal obstruction, Ascarial encephalopathy are some of the most serious complications of the diseases which do occur, fortunately in a small number of cases. In Ayurveda many herbo-mineral preparations were used, a potent, safe, minimal dose preparation needed in the present era. Krimimudgararasa is mentioned in many classics as effective remedy. The drugs in Krimimudgararasa are Parada, Gandaka, Ajamoda, Vidanga Kupilu, Palashabeeja which are Katu-Tikta rasa, Laghu, Rukṣa, Tikṣana guna, Uṣṇa virya, Katu vipaka and Krimighna in Karma. This study to be comprised of Scientific documentation of the clinical efficacy of Krimimudgararasa (Herbo- mineral preparation) in Udarakrimi(Ascarislumbricoides, Enterobiusvermicularis, Necatoramericanus), for a duration of 7 days.

Disease Review
Intestinal helminthic infestation is one of the most common causes of chronic illness in the developing countries. In our country this problem is equally significant, it affect the children more frequently than adult. Helminthic infections are more prevalent among school children aged 5 to 15 yrs. Ascaris related clinical disease is restricted to subjects with heavy worm load, and an estimated 1.2 to 2 million such cases, with 20,000 deaths, occur in endemic areas per year. The hookworm infestation is a leading cause of iron deficiency anemia, whipworm infestation in children causes growth retardation and anemia, while heavy infestation with both round worm and whip worm cause protein energy malnutrition. Our Ācharyas like Caraka, Suśruta, and Vāgbhaṭṭa etc had knowledge of Krimi. Ayurvedic literature explains it as Sahaja and Vaikarik krimi which is again classified in to Bahya and Abhayantara krimi. Abhayantara krimi are classified as Purishaja, Shleshamaja, and Raktaja krimi. Antraja krimi in present context refers to Vaikarik krimi residing in intestinal tract. The parasitic infection is classified into three types as per modern medical science viz. Protozoal, Helminthic and Arthropodal.

**Drug Review**

In all classic text of Rasaśastra, Krimimudgararasa is indicated for the treatment of intestinal worms and Agni dēpana occur within three days. The ingredients of this combination are Krimighna drug which may helps to paralyse or kill the worms and other ingredient were also Krimighna property. Pārada and Gandhaka act as catalyst. The drugs in Krimimudgararasa are parada, Gandaka, Ajamoda, Vidanga Kupilu, Palashabeeja which are Kaṭu-Tikta rasa, Laghu, Rukṣa, Tikṣana guna, Uṣṇa virya, Kaṭu vipaka and Krimighna in Karma.

**MATERIALS AND METHODS**

**Pharmaceutical Study**

Krimimudgararasa were prepared in Rasa shastra and Bhaiṣajya Lab in Amrita School of Ayurveda, Kollam as per textual reference. Samanya śodhana of Pārada were done with sudha curna, lasuna and saîndhava lavana. Shodana of gandhaka were done in milk. Kupilu sodhana were done with
Krimimudgararasa in Darakrими (Ascaris lumbricoides, Enterobius vermicularis, Necator americanus)

Research Article

PIJAR/VOLUME-I/ISSUE –II/OCTOBER-NOVEMBER-2016  35

Table no1
Pharmaceutical preparation of Krimimudgararasa

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>BOTANICAL NAME</th>
<th>PART USED</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shudda parada</td>
<td>Purified mercury</td>
<td>As such</td>
<td>1 parts</td>
</tr>
<tr>
<td>Shudda gandhaka</td>
<td>Purified sulphur</td>
<td>As such</td>
<td>2 parts</td>
</tr>
<tr>
<td>Ajamoda</td>
<td>Apium leptophyllum</td>
<td>Dried fruits</td>
<td>3 parts</td>
</tr>
<tr>
<td>Vidanga</td>
<td>Embelia ribes</td>
<td>Dried matured fruits</td>
<td>4 parts</td>
</tr>
<tr>
<td>Shudda kupilu Beeja Majja</td>
<td>Strychnous nuxvomica</td>
<td>Dried Endosperm</td>
<td>5 parts</td>
</tr>
<tr>
<td>Palasha beeja</td>
<td>Butea monosperma</td>
<td>Dried seeds</td>
<td>6 parts</td>
</tr>
</tbody>
</table>

Clinical study

Clinical study was conducted in 30 children, whose stool examination showed presence of ova/cyst. It was open label study with pre and post test design where in children were assigned to single group. 125mg of Krimimudgararasa was administered mixing with honey as anupana once daily for a period of 7 days. Initial assessment was done before starting the study followed by review on 4th, 8th and follow up assessment on 30th day. The progress and response to the treatment were observed with subjective and objective parameters. The data obtained were assessed by applying statistical scoring system

Criteria for the Assessment:

- Stool free from the ova/cyst after proper pathological examination after completion of treatment.
- Absence of clinical signs and symptoms of Krimiroga.
Cured or uncured was decided on the basis of following two points.

Cured:
- Complete relief in the initial chief complaints of the patient along with the positive improvement (100% relief in signs and symptoms).
- Complete microscopic absence of ova/cyst in Stool confirmed by Stool examination.

Marked Relief:
- More than 60% relief in sign and symptom
- Complete Microscopic absence of ova/cyst in Stool.

Moderate Relief:
- 30-59% relief in sign and symptoms.
- Complete Microscopic absence of ova/cyst in Stool.

Unchanged (No relief):
- Presence of Ova/Cyst/Worm in the Stool examination after the treatment.

OBSERVATION AND RESULTS
During the period of drug administration no any adverse effect of drug were observed and were palatable to all the patients. On statistical analysis of gathered data, following observations were made.

Effect of therapy based on assessment criteria

Table No 2
Response Rate With Respect To Jwara

<table>
<thead>
<tr>
<th></th>
<th>Absent</th>
<th>Mild grade</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>19</td>
<td>63.3%</td>
<td>11</td>
<td>36.7%</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>25</td>
<td>83.3%</td>
<td>5</td>
<td>16.7%</td>
</tr>
<tr>
<td>After 7th day</td>
<td>28</td>
<td>93.3%</td>
<td>2</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

Table No 3
Response Rate With Respect To Vivarnatha

<table>
<thead>
<tr>
<th></th>
<th>Absent</th>
<th>Only on face</th>
<th>Any half of the body</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Table No 4
Response Rate With Respect To *Udaraśula*

<table>
<thead>
<tr>
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<th>Absent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>19</td>
<td>63.3</td>
<td>7</td>
<td>23.3</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>After 3&lt;sup&gt;rd&lt;/sup&gt; day</td>
<td>26</td>
<td>86.7</td>
<td>4</td>
<td>13.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After 7&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>28</td>
<td>93.3</td>
<td>2</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
</tr>
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</table>

# Table No 5
Response Rate With Respect To *Sadana*

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<th>Absent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>9</td>
<td>30.0</td>
<td>21</td>
<td>70.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After 3&lt;sup&gt;rd&lt;/sup&gt; day</td>
<td>17</td>
<td>56.7</td>
<td>13</td>
<td>43.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After 7&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>27</td>
<td>90.0</td>
<td>3</td>
<td>10.0</td>
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# Table No 6
Response Rate With Respect To *Baktadweśa*

<table>
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<tr>
<th></th>
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<th>Moderate</th>
<th>Poor</th>
<th>No</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
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<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>4</td>
<td>13.3</td>
<td>21</td>
<td>70.0</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>After 3&lt;sup&gt;rd&lt;/sup&gt; day</td>
<td>24</td>
<td>80.0</td>
<td>5</td>
<td>16.7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>After 7&lt;sup&gt;th&lt;/sup&gt; day</td>
<td>29</td>
<td>96.7</td>
<td>1</td>
<td>3.3</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
Table No 7
Response Rate With Respect To Atisara

<table>
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<th>Atisara</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
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<td>Absent</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>BT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>21</td>
<td>70.0</td>
<td>8</td>
</tr>
<tr>
<td>After 3rd day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>76.7</td>
<td>7</td>
</tr>
<tr>
<td>After 7th day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>93.3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table No 8
Response Rate With Respect To Āsya Samsravam

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<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
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<td>Absent</td>
<td>Ocssional</td>
<td>Only in night</td>
</tr>
<tr>
<td>BT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>25</td>
<td>83.3</td>
<td>3</td>
</tr>
<tr>
<td>After 3rd day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>96.7</td>
<td>0</td>
</tr>
<tr>
<td>After 7th day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>96.7</td>
<td>1</td>
</tr>
</tbody>
</table>

Table No 9
Response Rate With Respect To Ánaha

<table>
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<tr>
<th>Ánaha</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>BT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>16</td>
<td>53.3</td>
<td>13</td>
</tr>
<tr>
<td>After 3rd day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>73.3</td>
<td>8</td>
</tr>
<tr>
<td>After 7th day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>76.7</td>
<td>7</td>
</tr>
</tbody>
</table>
“CLINICAL STUDY OF KRIMIMUDGARARASA IN DARAKRIMI (Ascaris lumbricoides, Enterobius vermicularis, Necator americanus)”  

Research Article

Table No 10  
Response Rate With Respect To Āṅgamarda

<table>
<thead>
<tr>
<th>Absent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Paired comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>BT</td>
<td>24</td>
<td>80.0</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>After 3rd day</td>
<td>25</td>
<td>83.3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>After 7th day</td>
<td>28</td>
<td>93.3</td>
<td>2</td>
</tr>
</tbody>
</table>

Wilcoxon signed rank test  

<table>
<thead>
<tr>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.414</td>
<td>.157</td>
</tr>
<tr>
<td>1.732</td>
<td>.083</td>
</tr>
<tr>
<td>1.89</td>
<td>.059</td>
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Table No 11  
Response Rate With Respect To Gudakaṇḍu

<table>
<thead>
<tr>
<th>Absent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Paired comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>BT</td>
<td>5</td>
<td>16.7</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td></td>
<td>After 3rd day</td>
<td>12</td>
<td>40.0</td>
<td>15</td>
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<tr>
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<td>After 7th day</td>
<td>30</td>
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Wilcoxon signed rank test  

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<th>p</th>
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<tbody>
<tr>
<td>3.66</td>
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<tr>
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</tr>
<tr>
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Table No 12  
Response Rate With Respect To Chardi

<table>
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<th>Moderate</th>
<th>Severe</th>
<th>Paired comparison</th>
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</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>BT</td>
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<td>10.0</td>
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<td></td>
<td>After 3rd day</td>
<td>25</td>
<td>83.3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>After 7th day</td>
<td>26</td>
<td>86.7</td>
<td>4</td>
</tr>
</tbody>
</table>

Wilcoxon signed rank test  

<table>
<thead>
<tr>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.732</td>
<td>.083</td>
</tr>
<tr>
<td>1.414</td>
<td>.157</td>
</tr>
<tr>
<td>2.236</td>
<td>.025</td>
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Table No 13
### Table No 14
Response Rate With Respect To *Purīśabheda*

<table>
<thead>
<tr>
<th>Purīśabheda</th>
<th>Uniformed</th>
<th>Semisolid</th>
<th>Watery with stool mass</th>
<th>Watery</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>20 66.7</td>
<td>6 20.0</td>
<td>3 10</td>
<td>1 3</td>
<td>BT-AT3rd</td>
<td>2</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>22 73.3</td>
<td>5 16.7</td>
<td>3 10</td>
<td>0 0</td>
<td>AT3rd - AT7th</td>
<td>1.34</td>
</tr>
<tr>
<td>After 7th day</td>
<td>24 80.0</td>
<td>4 13.3</td>
<td>2 7</td>
<td>0 0</td>
<td>BT-AT7th</td>
<td>2.12</td>
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### Table No 15
Response Rate With Respect To Round Worm

<table>
<thead>
<tr>
<th>Round Worm</th>
<th>Absent</th>
<th>0 to 1</th>
<th>2 to 3</th>
<th>Numerous</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>6 20.0</td>
<td>12 40.0</td>
<td>11 37</td>
<td>1 3</td>
<td>BT-AT3rd</td>
<td>4.123</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>15 50.0</td>
<td>10 33.3</td>
<td>5 17</td>
<td>0 0</td>
<td>AT3rd - AT7th</td>
<td>3.578</td>
</tr>
<tr>
<td>After 7th day</td>
<td>29 96.7</td>
<td>1 3.3</td>
<td>0 0</td>
<td>0 0</td>
<td>BT-AT7th</td>
<td>4.417</td>
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### Table No 15
Response Rate With Respect To Hook Worm

<table>
<thead>
<tr>
<th>Hook Worm</th>
<th>Absent</th>
<th>0 to 1</th>
<th>2 to 3</th>
<th>Numerous</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
<td>z</td>
</tr>
<tr>
<td>BT</td>
<td>21 70.0</td>
<td>8 26.7</td>
<td>1 3</td>
<td>0 0</td>
<td>BT-AT3rd</td>
<td>1.414</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>23 76.6</td>
<td>6 20.0</td>
<td>1 3</td>
<td>0 0</td>
<td>AT3rd - AT7th</td>
<td>2</td>
</tr>
<tr>
<td>After 7th day</td>
<td>26 86.7</td>
<td>4 13.3</td>
<td>0 0</td>
<td>0 0</td>
<td>BT-AT7th</td>
<td>2.449</td>
</tr>
</tbody>
</table>
Table No 16
Response Rate With Respect To Pin Worm

<table>
<thead>
<tr>
<th>Pin Worm</th>
<th>Absent</th>
<th>0 to 1</th>
<th>2 to 3</th>
<th>Numerous</th>
<th>Paired comparison</th>
<th>Wilcoxon signed rank test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>BT</td>
<td>5</td>
<td>16.7</td>
<td>19</td>
<td>63.3</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>17</td>
<td>56.7</td>
<td>11</td>
<td>36.7</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>After 7th day</td>
<td>30</td>
<td>100.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table no 17
Overall effect on symptoms.

<table>
<thead>
<tr>
<th>N</th>
<th>Total symptoms score Mean</th>
<th>SD</th>
<th>Paired comparison</th>
<th>Paired Differences Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>30</td>
<td>9.27</td>
<td>2.98</td>
<td>BT-AT3rd</td>
<td>4.63</td>
<td>2.01</td>
<td>12.636</td>
</tr>
<tr>
<td>After 3rd day</td>
<td>30</td>
<td>4.63</td>
<td>2.28</td>
<td>AT3rd - AT7th</td>
<td>3.37</td>
<td>1.50</td>
<td>12.320</td>
</tr>
<tr>
<td>After 7th day</td>
<td>30</td>
<td>1.27</td>
<td>1.23</td>
<td>BT-AT7th</td>
<td>8.00</td>
<td>2.45</td>
<td>17.889</td>
</tr>
</tbody>
</table>

Comparing over all symptoms the change in BT to AT 7th day was highly significant (P<0.001).

Graph No 1: Overall effect on symptoms.
Table No 18
Overall effect of therapy on the base of assessment criteria (Based on sign and symptoms and Stool report).

<table>
<thead>
<tr>
<th>Result</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured</td>
<td>46.66</td>
</tr>
<tr>
<td>Markedly improved</td>
<td>40</td>
</tr>
<tr>
<td>Unchanged</td>
<td>13.33</td>
</tr>
</tbody>
</table>

Despite the improvement in signs and symptoms, the Ova/Cyst was present in Stool examination after treatment in 13.33% of patients and it was decided to consider them as unchanged. In 40% of patients the Stool report after treatment didn’t show the presence of worms. There was marked improvement as for the signs and symptoms are considered. In 46.66% of patients the Stool report even after repeated examinations didn’t show the presence of any worms. On the other hand, there was total absence of signs and symptoms after treatment. So these are considered under cured category.

**Discussion**

*Krimiroga* hampers the growth and development of the child, decreases immunity and creates many allergic phenomena and cause recurrent cough and cold and other systemic diseases.
There are numerous herbal and herbo-mineral compound formulations, advised in the management of Krimiroga in classics which possess their own therapeutic values. Krimimudgararasa was chosen to study though antihelminthic activity of Krimimudgararasa was chosen to study the Krimighna property of compound, mentioned in Bhaiṣajya Ratnavali. The present clinical study was planned in a single group (30 children), aimed to assess the clinical efficacy of trial drug with the aid of microscopic findings of intestinal parasites, ova/cyst in stool and to evaluate the trial drug effect in 7 days.

**Microscopic Stool Examination:**
Round worm were present in 80% of cases before treatment. After 3rd day of the treatment 62.5% of cases were cured. After 7th day of treatment 95% of cases were cured. After 7th day out of 24 patients 23 were completely free from roundworm with P=0.003 value showing highly significant effect of Krimimudgararasa. Hook worm were present in 29.7% of cases before treatment. After 3rd of the treatment 23% of cases were not cured. After 7th day 13.3% of cases were not cured. After 7th day out of 9 patients 5 were completely free from hookworm with P=0.014 value showing highly significant effect of Krimimudgararasa. Pin worm were present in 83.3% of cases before treatment. After 3rd of the treatment 43.7% cases not cured. After 7th day 100% were completely cured. After 7th day out of 25 patients all were completely free from Pin Worm with P<0.001 value showing highly significant effect of Krimimudgararasa.

**Assessment criteria:** Jwara was present in 36.7% of cases before treatment. After 3rd day, of the treatment 16.7% of cases were not cured. After 7th day, 6.7% of cases were not cured. After 7th day, out of 11 patients 9 were completely free from Jwara with P=0.003 value showing highly significant effect of Krimimudgararasa. Vivarnata were present any half of the body in 36.3.3% before treatment. After 3rd day of the treatment, 13.3% of cases were not cured. After 7th day of treatment, 6.7% of cases were not cured. After 7th day
out of 11 patients 9 were completely free from Vivarṇata with \( P=0.002 \) value showing highly significant effect of Krimimudgararasa. Udara Śula were present in 36% of cases before treatment. After 3rd day of the treatment 17% of cases were not cured. After 7th day of treatment 3.3% of cases were not cured. After 7th day out of 11 patients 10 were completely free from Udara Śula with \( P=0.002 \) value showing highly significant effect of Krimimudgararasa. Sadana was present in 70% of cases before treatment. After 3rd day of the treatment 43.3% of cases were not cured. After 7th day out of 11 patients 10 were completely free from Sadana with \( P=0.0001 \) value showing highly significant effect of Krimimudgararasa. Bhaktadwēsa were present in 87% of cases before treatment. After 3rd day of the treatment 16.7% of cases were not cured. After 7th day of treatment, 3.3% of cases were not cured. After 7th day out of 11 patients 10 were completely free from Bhaktadwēsa with \( P=0.0001 \) value showing highly significant effect of Krimimudgararasa. This is the effect of Dēpana and Pacana property of all the ingredients. Atisara were present in 29.7% and of cases before treatment. After 3rd day of the treatment, 23.3% of cases were not cured. After 7th day of treatment, 6.7% of cases were not cured. After 7th day out of 9 patients 7 were completely free from Atisara with \( P=0.011 \) value showing highly significant effect of Krimimudgararasa. Āsyasamsravam were present in 22% of cases, of cases before treatment. After 3rd day of the treatment, 3% of cases were not cured only in night. After 7th day of treatment, 3.3% of cases were not cured. After 7th day out of 5 patients 4 were completely free from Āsyasamsravam with \( P=0.038 \) value showing significant effect of Krimimudgararasa. Ānaha were present in 46.3% of cases before treatment. After 3rd day of the treatment, 26.7% of cases were not cured. After 7th day treatment, 23.3% of cases were
not cured. After 7th day out 14 patients 7 were completely free from Ānaha with P=0.005 value showing significant effect of Krimimudgararasa. Āṅgamarda were present mild in 19.7% of cases before treatment. After 3rd day of the treatment 16.7% of cases were not cured. After 7th day of treatment 6.7% of cases were not cured. After 7th day out of 6 patients 4 were completely free from Āṅgamarda with P=0.059 values showing no significant effect of Krimimudgara rasa. Gudakaṇḍu were present in 82.7% of cases before treatment. After 3rd of the treatment, 60% of cases were not cured. After 7th day 100% were completely cured. After 7th day out of 25 patients all were completely free from Gudakaṇḍu with P<0.0001 value showing highly significant effect of Krimimudgararasa. Chardi were present in 40% of cases before treatment. After 3rd day of the treatment, 16.3% of cases were not cured. After 7th day of the treatment, 13.3% of cases were not cured. After 7th day out of 6 patients 2 were completely free from chardi with P=0.025 value showing significant effect of Krimimudgararasa. Puriṣabhēda were present in 33% of cases before treatment. After 3rd of the treatment 26.7% of cases were not cured. After 7th day 20.3% of cases were not cured. After 7th day out of 10 patients 4 were completely free from Puriṣabhēda with P=0.034 value showing significant effect of Krimimudgar rasa.

Probable Mode Of Action: Pharmacodynamic Profile Of Krimimudgararasa

Krimimudgararasa is the kharaliya preparation. The ingredients of this combination is Pārada , Gandhaka, Ajāmoda, Vidanga ,Kupīlu and Palāsha Bīja has properties like Kaṭu and Tikta rasa, Laghu, Rukṣa, Tikshana guna, Uṣṇa virya, Kaṭu vipaka all are antagonist with Kapha Doṣa. Ingredients of the compound were Vata Kapha Śamana property and as Krimiroga is Vata Kapha dominant disease, the drug combination helps to relieves the symptoms of Krimi roga . Vidānga is Kaṭu Tikta rasa ,Kaṭu vipaka and Krimighna.Ajāmoda having the property
of Anulomana, helps to expel the worms from them intestinal tract. \textit{Kupīlu} correct the \textit{koṣta śaitilyatha} which helps in expulsions of worms. \textit{Palāsha Bīja} is the main drug which having \textit{krimghna} property as per \textit{Bhavamishra}. Laxative action of \textit{Palāsha} helps in the easy expulsion of worms. Palasonin (acetone (C6 H22 O6) inhibited the glucose up take and depleted the glycogen content in the presence of glucose, indicating that palasonin affects the energy generating mechanism of parasite. It also significantly increased lactic acid suggesting inhibiting of ATP production. The results indicating the palasonin may act via either inhibiting of Energy metabolism and / or alteration the motoractivity of parasite.\textsuperscript{10} Tikta rasa and Agni Pradipaka Karma correct the status of Agni. Kajjali holistically and synergistically acts with the herbal ingrdients. This proves that there is an immediate action of the drug on the krimis.

**CONCLUSION**

In microscopic stool examination shows statistically highly significant in ova/cyst of \textit{Pin Worm, Round Worm}. Significant in ova/cyst of \textit{Hook Worm}. \textit{Krimimudgararasa} statistically shows highly significant improvement in \textit{Jwara }, \textit{Sadana, Bhaktadwēṣa, Gudakandu}, and all other symptoms except Āṅgamarda were statistically significant in the duration of 7 days. The trial drug \textit{Krimimudgararasa} showed statistically highly significant especially in the symptoms of \textit{Gudakandu}. It was hundred percentages effective. \textit{Bhaktadwēṣa} had improved within three day. \textit{Krimimudgararasa} showed more effect in \textit{Pin Worm} compared with \textit{Round Worm} and \textit{Hook Worm}. It completely eliminates \textit{Pin Worm} within 7 days and partially \textit{Round Worm} and \textit{Hook Worm}. During the clinical study observed that, the trial drug is free from side effects or toxic effect. \textit{Krimimudgararasa} a herbo-mineral preparation has shown antihelminthic action in 7 days and it controls all other general symptoms of \textit{Krimi roga}. Black sulphide of mercury holistically and synergistically acts with the herbal ingrdients. Herbal drugs
along with *kajjali* makes the preparation act fast, even in minimal dose

**Limitation of study**
- Sample of 30 children.
- Duration of study is short.

**Suggestion for further research**
- Pharmacological action of the drug can be carried out for further research.
- Study can be carried out on large sample with hematological parameters.
- Study can be carried out for a large period with longer follow up.
- Long term toxicity study can be conducted.

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"CLINICAL STUDY OF Krimimudgararasas in Darakrimi (Ascaris lumbricoides, Enterobius vermicularis, Necator americanus)"

Research Article

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