The Anthelminthic Effectivity of Gandarusa Leaves 
(*Justiciagendarussa Burm. F.*) Infusion and Kapok Seed 
Infusion (*Ceibapentandra L.*) Against Female *Ascarissuum* In Vitro

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Abstract

Ascariasis is known as “soil transmitted helminths” which persons were infected by ingesting eggs were passed in the feces. The most prevalence of Ascariasis in school children are more than 30%, with resultant impairment in growth retardation, intellectual, and cognitive development. The purpose of this research was to determine the anthelminthic effectivity of Gandarusa Leaves Infusion (GLI), Kapuk Seed Infusion (KSI) were the same as pyrantelpamoat as against female *Ascarissuum* in vitro. Methods of the research was true laboratory experimental, using 1200 female worms of *Ascarissuum*, which GLI and KSI treatment were divided into 8 treatment groups (GLI1, GLI2, GLI3, GLI4 and KSI1, KSI2, KSI3, KSI4), one negative control with NaCl, positive control with pyrantelpamoat. The treatment groups were incubated at 37°C for 3 hours. The data measured were number of paralyzed and dead worms. Data was analyzed using ANOVA, followed by Tukey HSD test \( \alpha = 0.05 \). The results showed that the highest percentage number of paralyzed and dead worms on GLI 4 was 70%, on KSI4 was 40.83%, GLI 4 was not significant (\( p>0.05 \)) with pyrantelpamoat. GLI and KSI contain various compound such as alkaloid, tannin and saponin. Conclusion GSI 4 had an anthelminthic effectivity the same as with pyrantelpamoat.

**Keywords:** anthelminthic, *Ascarissuum*, Gandarusa Leaves Infusion, Kapok Seed Infusion

INTRODUCTION

Ascariasisis caused by intestinal nematode such as Ascaris lumbricoides. Ascariasis infection is known as “the one main of soil-transmitted helminth infections”. The people were infected Ascaris lumbricoides by ingestion of fully developed eggs in raw vegetables.¹,² The prevalence peak of ascariasis infections are in children between aged 5-15 years, with resultant inmalnutrition, growth stunting, intellectual retardation, impaired in physical, cognitive development, and educational deficits.²,³ The heavy infection of ascariasis causing ileus obstructive.⁴ The Ascariasis disease is the helminthic infection in tropical developing

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country, which responsible in estimated 60,000 deaths every year\(^{(5)}\). Ascariasis infection is a risk factor for human with poor personal hygiene, poor sanitation and human feces are used as a fertilizer.\(^{(6)}\)

Drug of choice of the Ascariasis disease are albendazole, mebendazole and pyrantel pamoate especially for pregnancy woman, nevertheless pyrantel pamoate causing intestinal gangrene, fever, headache, abdomen cram, tenesmus, nausea, vomitus, paralysis vermifuges which should be avoided in patients with intestinal obstruction.\(^{(7,8)}\) The alternative therapies for managing ascariasis could be used herbs such as gandarusa leaves and kapok seed. Extract leaf and stem gandarusa had activity anthelmintic against Lumbricus worm.\(^{(9)}\) The purpose of this research was to determine the anthelmintic effectivity of Gandarusa Leaves Infusion (GLI), Kapuk Seed Infusion (KSI) were the same as pyrantel pamoat as against female *Ascarissuum* in vitro.

### METHOD AND MATERIALS

The method of the research was true laboratory experimental) using 1200 female worms of *Ascarissuum*, which were divided into 8 groups \((r = 4)\), group I, II, III, and IV were given Gandarusa Leaf Infusion (GLI) dose of 10%, 20%, 40%, 80%, and 100% respectively, group VI, VII, VIII and IX were given Kapok Seed Infusion, group IX was given NaCl 0.9% solution as a negative control and group X was given 0.05% pyrantel pamoate suspension as a positive control. Treatment groups were incubated at 37\(^{\circ}\)C for 3 hours. The data measured was average percentage of dead worms. Data was analyzed using ANOVA, followed by Tukey HSD test, \(\alpha = 0.05\).

### MATERIALS

Gandarusa Leaves, Kapok seeds, NaCl 0.9% solution, water, pirantel pamoat 0.05% suspension.

### TOOLS

Becker glass, measuring cup, incubator, infusa pan, strainer, chopstick, knife, handscoen, thermometer, timer, stir bar, stopwatch, plastic container.

### RESULTS

All of herbs of Gandarusa Leaf Infusion (GLI) and Kapok Seed Infusion had anthelmintic effectivity against *Ascarissuum*. The result of GLI 4 with concentration 80% had no significance activity with positive control (pyrantel pamoat). GLI 4 had the same as effectivity with pyrantel pamoat 0.05%. The highest average percentage number of paralysed and dead worms was on Gandarusa Leaf Infusion(GLI) 4 was 69.97% after incubation on 3 hours at 37\(^{\circ}\)C.
FIGURE 1 (a) Ascaris suum in Gandarusa Leaf Infusion (b) Ascaris suum in Kapok Seed Infusion

TABLE 1: ANOVA average percentage dead of Ascaris suum

<table>
<thead>
<tr>
<th>Log</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tbody>
<tr>
<td>Between Groups</td>
<td>3.379</td>
<td>9</td>
<td>.375</td>
<td>97.979</td>
<td>.000</td>
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<tr>
<td>Within Groups</td>
<td>.115</td>
<td>30</td>
<td>.004</td>
<td></td>
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<tr>
<td>Total</td>
<td>3.494</td>
<td>39</td>
<td></td>
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### TABLE 2. Post Hoc Tukey HSD

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<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>Control (+)</th>
<th>Control (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>NS</td>
<td>NS</td>
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<td>2</td>
<td>II</td>
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<tr>
<td>10</td>
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Table caption
I : Gandarusa Leaf Infusion 10% ** : Highly Significance
II : Gandarusa Leaf Infusion 20% * : Significance (<0.05)
III : Gandarusa Leaf Infusion 40%NS : Non Significance (≥ 0.05)
IV : Gandarusa Leaf Infusion 80%
V : Kapok Seed Infusion 2.5%
VI : Kapok Seed Infusion 5%
VII: Kapok Seed Infusion 7.5%
VIII : Kapok Seed Infusion 10%
Control (+) : PylrantelPamoat 0.05%
Control (-) : Na Cl 0.9%

### DISCUSSION

All of the Gandarusa Leaf Infusion (GLI) had antihelminthic effectivity against *Ascaris suum* because GLI containing alkaloid and saponin compound which inhibition kolinesterase enzyme so that acetylcholine is not broken out, resulting in acetylcholine accumulates on neuromuscular nicotinic receptor due to increasing muscle contraction than continuous stimulating nicotinic receptor that causing muscle paralyzed and dead of *Ascaris suum*. \(^{(10-12)}\) Saponinis also can causing gastrointestinal irritation to *Ascaris suum*. \(^{(11)}\) Tannin compound contained in GLI could changing membrane permeability and denaturation protein that disturbing haemostasis metabolism resulting in dead worm. \(^{(13)}\) GLI 4 concentration 80% had the same as effectivity with pylrantelpamoat, it was resulting in the same as mechanism...
between alkaloid, saponin compound with pyrantel pamoate had activity like as blocking the neuromuscular system of the worm, which becomes instantly immobilized.

CONCLUSION
Gandarusa Leaf infusion concentration 4 (80%) had an anthelminthic effectivity the same as with pirantel pamoat.

REFERENCE