The Anthelmintic 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 anthelmintic effectivity of Gandarusa Leaves Infusion (GLI), Kapok 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 pirantelpamoat. GLI and KSI contain various compound such as alkaloid, tannin and saponin. Conclusion GSI 4 had an anthelmintic effectivity the same as with pirantelpamoat.

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

INTRODUCTION

Ascariasis caused by intestinal nematode such as *Ascarislumbricoides*. Ascariasis infection is known as “the one main of soil-transmitted helminth infections”. The people were infected *Ascarislumbricoides* 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 malnutrition, 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

country, which responsible in estimated 60.000 deaths every year⁽⁵⁾ Ascariasisinfection is a risk factor for human with poor personal hygiene, poor sanitation and human feces are used as a fertilizier.⁽⁶⁾

Drug of choice of the Ascariasis disease are albendazole, mebendazole and pyrantelpamoat especially for pregnancy woman, nevertheless pyrantelpamoat 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 ascariasiscould be used herbs such as gandarusa leaves and kapok seed. Extract leaf and stem gandarusahad activity anthelmintic against Lumbricus worm.⁽⁹⁾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.

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, VII and VIII were given Kapok Seed Infusion, group IX was given NaCl 0.9% solution as a negative control and group X was given 0,05% pyrantelpamoate suspension as a positive control. Treatment groups were incubated at 37°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, pirantelpamoat 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 withconcentratin 80% had no significance activity with positive control (pyrantelpamoat). GLI 4 had the same as effectivity withpyrantelpamoat 0.05%. Thehighest 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 °C.

FIGURE.1 (a) *Ascarissuum* in Gandarusa Leaf Infusion (b) *Ascarissuum* in Kapok Seed Infusion

TABLE 1 : ANOVA average percentage dead of *Ascarissuum*

ANOVA

Log

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.379	9	.375	97.979	.000
Within Groups	.115	30	.004		
Total	3.494	39			

TABLE 2. Post Hoc Tukey HSD

No	Treatment	I	II	III	IV	V	VI	VII	VIII	Control (+)	Control (-)
1	I		**	**	**	NS	NS	*	**	**	**
2	II	**		NS	**	**	**	**	NS	**	**
3	III	**	NS		NS	**	**	**	NS	**	**
4	IV	**	**	NS		**	**	**	**	NS	**
5	V	NS	**	**	**		NS	**	**	**	**
6	VI	NS	**	**	**	NS		*	**	**	**
7	VII	*	NS	**	**	**	*		NS	**	**
8	VIII	**	NS	NS	**	**	**	NS		**	**
9	Control(+)	**	**	**	NS	**	**	**	**		**
10	Control (-)	**	**	**	**	**	**	**	**	**	

Table caption

I : Gandarusa Leaf Infusion 10%

II : Gandarusa Leaf Infusion 20%

III : Gandarusa Leaf Infusion 40%

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 (+) :PyrantelPamoat 0.05%

Control (-) : Na Cl 0.9%

** : Highly Significance

* : Significance (<0.05)

NS : Non Significance (≥ 0.05)

DISCUSSION

All of the Gandarusa Leaf Infusion (GLI) had anthelmintic effectivity against *Ascarissuum* 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 nichotinic receptor that causing muscle paralyzed and dead of *Ascarissuum*.⁽¹⁰⁻¹²⁾ Saponinis also can causing gastrointestinal irritation to *Ascarissuum*.⁽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 pyrantelpamoat, it was resulting in the same as mechanism

between alkaloid, saponin compound with pyrantelpamoat had activity like as blocking the neuromuscular system of the worm, which becomes instantly immobilized.

CONCLUSION

Gandarus Leaf infusion concentration 4 (80%) had an anthelmintic effectivity the same as with pirantelpamoat.

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