

**COMPARATIVE ANTIHELMINTIC ACTIVITIES OF
Morinda citrifolia L. and *Leucaena leucocephala* Lam. INFUSES
ON *Ascaris suum* Worm IN VITRO METHOD**

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Abstract

Sixty percent of Indonesian people were estimated of worm infected. *Morinda citrifolia* and *Leucaena leucocephala* are traditional medicine for helminthiasis. *Morinda citrifolia* is a popular fruit and was used for more indications, it has an expensive price. On the contrary *Leucaena leucocephala* has cheap price. Base on the differences, we researched the antihelmintic activities to *Ascaris suum*. The antihelmintic activities were conducted using experimental in vitro technique. Control (NaCL 0.9% solution), reference (mebendazole) and test compound were tested by 10 worms. Parameters are the amount of dead worms in 24 hours and the onset of action. Onset of action is calculated by the time needed to kill all *Ascaris suum*. The results were statistically analyzed. *Morinda citrifolia* fruit infusion has best antihelmintic activity at the concentrations 30%, onset of action at 30% is 11 hours. *Leucaena leucocephala* infuse has best antihelmintic activity at the concentrations 30%, onset of action at 30% is 15 hours. In conclusion the strongest antihelmintic activity was infuses of *Morinda citrifolia* followed *Leucaena leucocephala*.

Key word : *Morinda citrifolia* L., *Leucaena leucocephala* Lam., *Ascaris suum*, Antihelmintic.

INTRODUCTION

Helminthic Infection is a problem that interrupts the quality of the life and sometime it may develops to the serious diseases, decrease the human resource capacity. Therefore the antihelminthic are needed to maintain the best of life.

Indonesian people knew the traditional medicine of antihelminthic, e.g. , *Morinda citrifolia*, and *Leucaena leucocephala*.^{1,2}

In tradisional medicine *Leucaena leucocephala* used for antihelminthic, diuretic, diabetes mellitus, aphrodisiac, inflammation, and tluseben. And *Morinda citrifolia* used as antihelmintic, antipyretic, antitusif, obesity, rheumatism, lumbago, etc.^{1,2}

Pharmacological Effects of *Leucaena leucocephala* base on the research, methanol extract has antidiabetic activity on rat.³ The study to characterize immunomodulatory activities of the original extract and its derivatives by exploring their effects on Raw macrophage 264.7 functions and their antioxidant activity, found that C-glycosidic 2-propanol derivative (PE) may act as a potent anti-inflammatory agent, and its sulphated derivative (SPE) may act as an inducer of macrophage functions against pathogens.⁴

Pharmacological Effects of *Morinda citrifolia* it has a broad range of therapeutic effects, including hypoglycemic, analgesic, hypotensive, antibacterial, antiviral, antifungal, antitumor. immune enhancing effects^{1,2}.

The chemical compound of *Leucaena leucocephala* Protein 10.6 gram, - fat 0.5 gram, - carbohydrates 26.2 gram, - calcium 155 miligram, - fosfor 59 gram, - iron 2,2 gram, - vitamin A 416 SI, vitamin B1 0,23 miligram - vitamin C 20 miligram. Polyprenol, Ficaprenol-11 (polyprenol) (1), squalene (2), lupeol (3), β -sitostenone (4), trans-coumaric acid (5), cis-coumaric acid (6) pheophytin-a (7), pheophorbide a methyl ester (8), methyl-132-hydroxy-(132-S)- pheophorbide-b (9) and aristo-phyll-C (10), mimosine (β -N-(3-Hydroxy-4 pyridone)- α amino propenoic acid as a toxin.⁶ The chemical compound of *Morinda citrifolia*, scopoletin, octoanoic acid, potassium, vitamin C, terpenoids, alkaloids, anthraquinones (such as nordamnacanthal, morindone, rubiadin, and rubiadin-1-methyl ether, anthraquinone glycoside), β -sitosterol, carotene, vitamin A, flavone glycosides, linoleic acid, Alizarin, amino acids, acubin, L-asperuloside, caproic acid, caprylic acid, ursolic acid, rutin, and a putative proxeronine[21-32].⁶

Now, after many researchs have been done to *Morinda citrifolia*, the pharmacological effect, phytochemistry contents, etc. *Morinda citrifolia* has higher economic value. It has been patented by The International food suplement companies in the various name and products, e.g. Java Noni, Tahitan Noni, Prime Noni. In Indonesia *Morinda citrifolia* product are Pacecap, Pacego, etc.

Base on the same using in tradisional medicine, but differences in economic value, and to promote of both as a antihemithic which tested, we compare its antihelminthic activity.

MATERIAL AND METHODS

Sample :

Ascaris suum Worm, *Morinda citrifolia*, *Leucaena leucocephala*, NaCL (E.Merck), Mebendazole

Equipment :

Infuses equipment, laboratory glass equipment.

Preparation of *Morinda citrifolia* and *Leucaena leucocephala* infuses

Both of fresh fruit of *Morinda citrifolia* and seed of *Leucaena leucocephala* were sliced. Each of it was made infuses with the concentration : 20%, 30%, 40%, 50%,

Preparation of mebendazole

500 mg mebendazole was dissolved in 200 ml of aquadest.

Procedure

Placing 10 worms in each 200 ml of control solution (NaCl 0.9% solution), Mebendazole solution (as reference), and 20% to 50% infuses solution of fresh fruit of *Morinda citrifolia* and seed of *Leucaena leucocephala* respectively. The experiment was conducted for 24 hours and the amount of dead worm is being analyze.

Parameter are the amount of dead worms in 24 hours and the onset of action.

Onset of action is calculated by seeing the amount of time to kill all 10 *Ascaris suum*.

Experiment was conducted three times. The outcome was analyzed using Anova test

RESULT

The result of experiment from *Morinda citrifolia* infuses

Table 1. The total % (average) of dead worms by *Morinda citrifolia* infuses in concentration 10%, 20%, 30%, 40% and 50%.

Hour	The total % (average) of dead worms by						
	Control (NaCl 0.9%)	Mebendazol 500 mg	<i>Morinda citrifolia</i> infuses concentration				
			10%	20%	30%	40%	50%
1	0	0	0	0	0	6.7	1
2	0	3.3	0	0	0	23.3	26.7
3	0	13.3	0	0	7	40	36.7
4	0	13.3	3.3	6.7	13.3	50	46.7
5	3.3	16.7	6.7	10	16.7	63.3	63.3
6	3.3	20	13.3	10	26.7	73.3	86.7
7	3.3	26.7	13.3	13.3	36.7	80	93.3
8	3.3	26.7	13.3	20	66.7	86.7	100
9	3.3	30	13.3	20	86.7	9.67	
10	3.3	30	16.7	23.3	96.7	100	
11	3.3	36.7	23.3	23.3	100		
12	6.6	50	26.7	26.7			
13	6.6	66.7	26.7	36.7			
14	6.6	76.7	30	46.7			
15	6.6	93.3	33.3	53.3			
16	6.6	93.3	33.3	53.3			
17	6.6	100	33.3	56.7			
18	1		36.7	66.6			
19	1		36.7	70			
20	1		40	73.3			
21	1		46.7	76.6			
22	13.3		46.7	83.3			
23	13.3		50	90			
24	13.3		53.3	93.3			

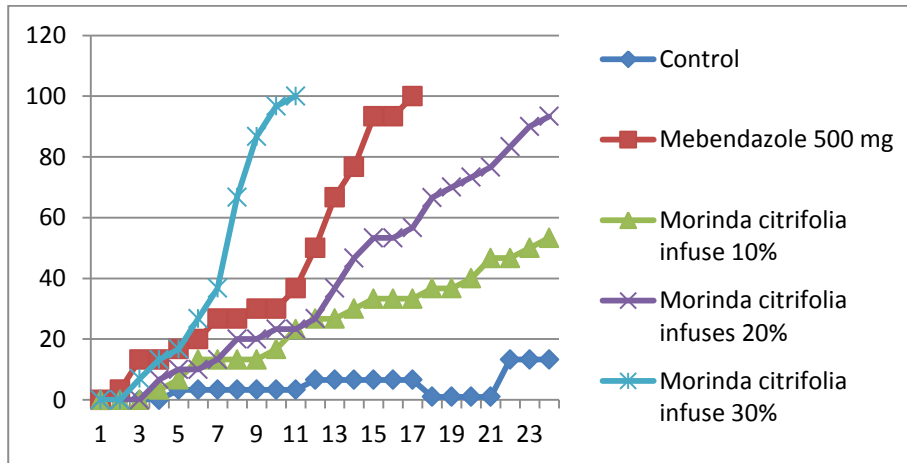


Fig 1. The total % (average) of dead worms by *Morinda citrifolia* infuses at concentration 10%, 20%, 30%, 40% and 50%.

The result showed that the concentration of *Morinda citrifolia* infuses 30%, 40% and 50% produced anthelmintic effect. Analytical statistic result, the minimal concentration which has similar effect with Mebendazole is 30% infuse. Onset of action for concentration 50%, 40%, 30% are at hour 8, 10, and 11 respectively.

Among those concentrations of *Morinda citrifolia* infuses, 30% infusion is the minimal concentration which has similar effect with Mebendazole as anthelmintic of *Ascaris suum*.

The result of experiment from *Leucaena leucocephala* infuses

Table 2. The total % of dead worm by *Leucaena leucocephala* infuses in concentration 10%, 20%, 30%, 40% and 50%

Hour	The total % (average) of dead worms by						
	Control (NaCl 0.9%)	Mebendazol 500 mg	<i>Leucaena leucocephala</i> infuses concentration				
			10%	20%	30%	40%	50%
1	0	0	0	0	0	6.7	16.7
2	0	3.3	0	3.3	6.7	16.7	20
3	0	13.3	3.3	16.7	16.7	30	33.3
4	0	16.7	6.7	26.7	26.7	30	43.3
5	0	20	13.3	26.7	36.7	53.3	60
6	0	20	13.3	40	50	63.3	76.7
7	0	23.3	13.3	40	53.3	66.7	80
8	0	23.3	23.3	50	56.7	73.3	90
9	0	26.7	30	53.3	70	80	93.3
10	0	26.7	33.3	60	80	93.3	100
11	0	30	43.3	60	86.7	96.7	
12	0	46.7	50	73.3	86.7	100	
13	0	63.3	53.3	76.7	93.3		
14	0	76.7	56.7	76.7	96.7		
15	0	90	56.7	80	100		
16	0	100	60	86.7			
17	0		70	93.3			
18	0		70	96.7			
19	0		73.3	100			
20	0		76.7				
21	0		83.3				
22	0		83.3				
23	0		90				
24	6.7		93.3				

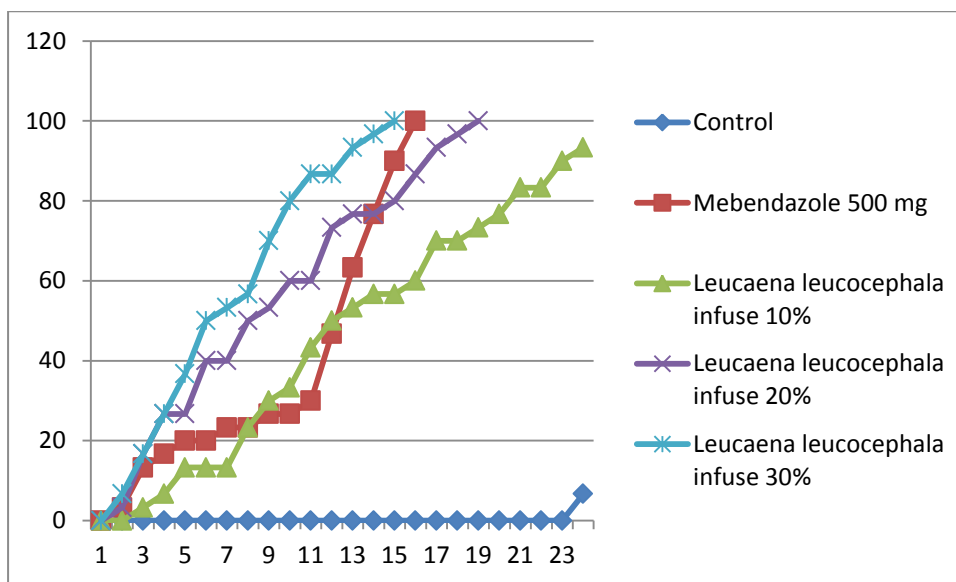


Fig 2. The total % (average) of dead worms by *Leucaena leucocephala* infuses at concentration 10%, 20%, 30%, 40% and 50%.

The result of experiment from *Leucaena leucocephala* infuses

The result showed that the concentration of *Leucaena leucocephala* infuses 20%, 30%, 40% and 50% produced anthelmintic effect. Analytical statistic result, the minimal concentration which has similar effect with Mebendazole is 30% infuse. Onset of action for concentration 50%, 40%, 30%, 20% are at hour 10,12, 15 and 19 respectively.

Comparative antihelmintic activity between *Morinda citrifolia* 30% infuse and *Leucaena leucocephala* 30% infuse.

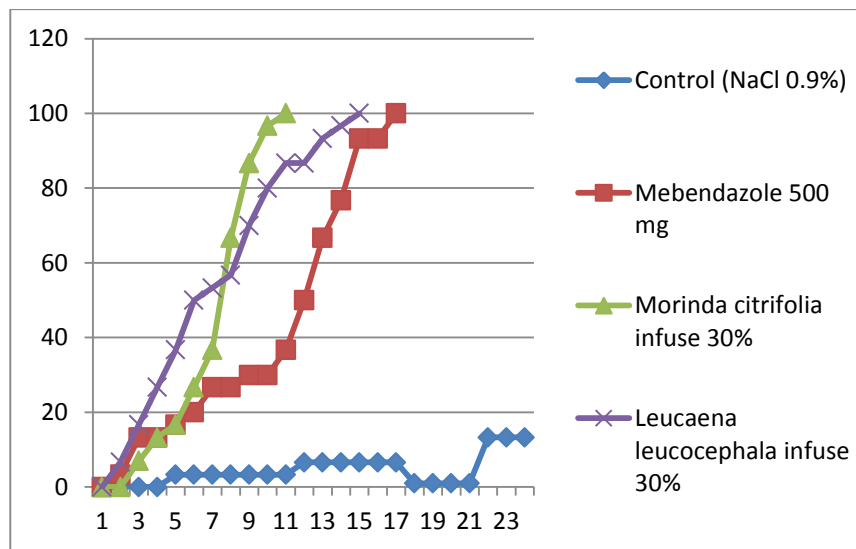


Fig 3. The total % (average) of dead worms by *Morinda citrifolia* 30% infuse and *Leucaena leucocephala* infuses 30%

CONCLUSION

Comparative antihelmintic activity between *Morinda citrifolia* 30% infuse and *Leucaena leucocephala* 30% infuse (Fig.3), *Morinda citrifolia* 30% infuse more active than *Leucaena leucocephala* 30% infuse.

Onset of action between *Morinda citrifolia* 30% infuse and *Leucaena leucocephala* 30% infuse, are *Morinda citrifolia* 30% infuse at hour 11 shorter than *Leucaena leucocephala* 30% infuse at hour 15.

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