

## The Effect of Level of Dryness of Papaya (*Carica papaya L.*) Seeds as Anthelmintic in Primary School-Age Children

RahmatHaji Saeni, Erdiawati Arief

Department of Nutrition, Polytechnic of Health, Mamuju, West Sulawesi, Indonesia

Corresponding Author: RahmatHaji Saeni

### ABSTRACT

**Background:** Soil-transmitted helminth (STH) infection is a global public health problem in the world. More than 1.5 billion people or 24% of the world population is infected by parasitic worms and 300 million of them patients with severe infections to 150 thousand deaths occur each year due to STH infection. This study aims to determine the effectiveness of papaya seeds flour as anthelmintic.

**Method:** this was an experimental study with quasi-experimental design. Stool examination were conducted to assess the status of STH infection. Children who positive for STH infection will be included as sample that will be divided into three groups. Papaya seeds will be dried for 2 hours, 3 hours and 4 hours at a temperature of 50°C and made into flour. Every children will get 2 gr of papaya seeds flour every day for a week, then the second stool examination will be conducted to determine the status of STH infection.

**Results:** Eighty-three out of 126 children were positive for STH infection. From 83 children, there were 48 children refuse to be included as sample in the study. The total number of sample was 35 children. From 3 groups of intervention, there were no difference effectiveness of papaya seeds flour as anthelmintic.

**Conclusion:** The papaya seeds flour can be used as anthelmintic formula in preventing STH infection in school-age children.

**Keywords:** Papaya seeds flour, school-age children, anthelmintic

### INTRODUCTION

Soil-transmitted helminth (STH) infection is a global public health problem in the world. [1,2] It is estimated that more than 1.5 billion people or 24% of the world

population are infected by STH worldwide. [1] The main species that infect people are the roundworm (*Ascaris lumbricoides*), whipworm (*Trichuris trichuria*) and two species of hookworms (*Necator americanus* and *Ancylostoma duodenale*). [1,2] STH is transmitted to humans through fecally-contaminated soil in areas where sanitation is poor and less of personal hygiene. It impaired to nutrition, vitamin deficiency, anemia and decreased productivity, growth, and development of children, learning, and school performance. [3-5]

The STH infection is one of public health problem in Indonesia. [5,6] It is estimated that the prevalence of STH infection was 28,12%. [6] The target of STH infection in Indonesia is the reduction of STH infection in 2019. The indicator of the reduction is the prevalence of STH infection below 10% in all the districts. [7]

Papaya (*Carica papaya L.*) seeds contain enzymes that can be used as an anthelmintic. [8,9] As an anthelmintic substance alkaloid compounds in the papaya consisting of papain, karpain and chymopapain could digest protein and curdle milk. [10,11] Papain is an active compound that has the ability to accelerate the process of protein digestion. [8] It serves as a proteolytic enzyme papain enzyme or protein. [8] Papain is useful as an active ingredient in medicines such as deworming. [8,9,12]

In addition, in Indonesia the use of medicines derived from nature is increasingly in demand by public. It is because drugs from natural ingredients or traditional medicine are trusted have fewer

side effects than chemical medicine and are relatively easy to obtain. The use of various kinds of plants as food and medicine has been carried out by various parties for long time. This is done as an effort to get a good body condition. Although the traditional medicine do not know the content of substances that are beneficial to the body scientifically. [13,14]

This work aims to analyze the effect of the level of dryness of papaya seeds as anthelmintic in primary school children in Mamuju District, West Sulawesi, Indonesia.

## METHODS

### Study site

This research conducted in 2 (two) sites between May and July 2019 in Mamuju District, West Sulawesi Province, Indonesia. The first site was in the Tadui Village, Mamuju District, West Sulawesi

Province, Indonesia and the second one was in the Laboratory of Department of Nutrition, Polytechnic of Health, Mamuju. The first site was location for assessing the status of STH infection in the population. The status of STH infection assessed by conducting stool examination. If the child positive for STH infection then he/she will be included as sample. The second site was location for formulating the papaya seeds as flour that will be given to the sample.

### Study setting

This was an experimental study with quasi-experimental research design. The population of this study was all primary school-age children in Tadui Village, Mamuju District, West Sulawesi Province, Indonesia. The sample was all primary school-age children who positive for STH infection in Tadui Village, Mamuju District, West Sulawesi, Indonesia.

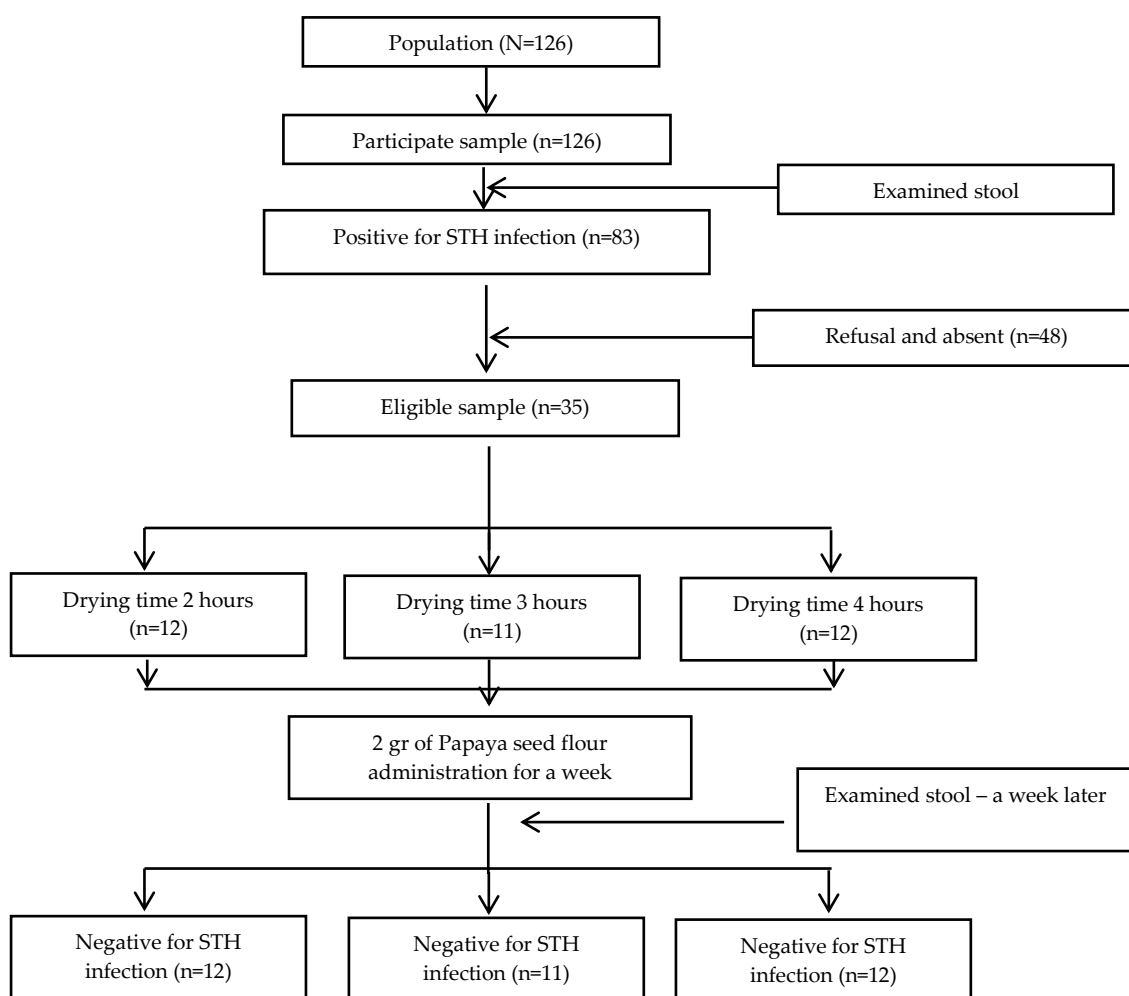


Figure 1. Consort Diagram

### Data collection procedure

All primary school-age children in Taduy Village assessed the status of STH infection by examining their stool. To collect stool, every child was given a stool pot and returned in the next day. The stool was examined under the microscope by using Kato-Katz method by health analysts in the Laboratory of Department of Nutrition, Polytechnic of Health, Mamuju. Eighty-three out of 126 children were positive for STH infection. From 83 positive for STH infection, there were 48 children refuse to be included as sample in the study. The total number of sample was 35 children. Then, samples were divided into three groups: Group 1 (will get papaya seeds which were dried for 2 hours and then made into flour), Group 2 (will get papaya seeds which were dried for 3 hours and then made into flour), and Group 3 (will get papaya seeds which were dried for 4 hours and then made into flour). All samples will get 2 gr of papaya seeds flour for a week. After a week of treatment, the sample's stool will be assessed to examine the status of STH infection. The detail procedure of the research can be seen at Figure 1.

## RESULT

### Characteristics of respondents

Table 1. Characteristics of respondents

Characteristics	n	Percentage (%)
Gender		
Male	12	34.3
Female	23	65.7
Age (year)		
6	3	8.6
7	9	25.7
8	4	11.4
9	7	20.0
10	6	17.1
11	3	8.6
12	3	8.6
Class		
1st grade	10	28.6
2nd grade	4	11.4
3rd grade	7	20.0
4th grade	7	20.0
5th grade	3	8.6
6th grade	4	11.4

Based on Table 1 it can be seen that the highest number of respondents by gender, age and class were female (65.7%), 7 year

old (25.7%), and 1st grade (28.6%) respectively.

### Intervention by drying time

Table 2. Distribution of respondents divided into 3 groups by drying time of papaya seeds flour

Group	Drying Time (hours)	N	Percentage (%)
1	2	12	34.3
2	3	11	31.4
3	4	12	34.3

Based on Table 2 it can be seen that each of group 1 (papaya seeds dried for 2 hours) and group 3 (papaya seeds dried for 4 hours) has 12 respondents while group 2 (papaya seeds dried for 3 hours) has 11 respondents.

### Effectiveness of anthelmintic

Table 3. Effectiveness of papaya seeds flour as anthelmintic

Group	Status of STH infection			
	Before treatment		After treatment	
	Positive for STH infection (n)	%	Negative for STH infection (n)	%
1	12	100.0	12	100.0
2	11	100.0	11	100.0
3	12	100.0	12	100.0

Based on Table 3 it can be seen that all samples were positive for STH infection before treatment and after 1 week of treatment there were no sample positive for STH infection.

## DISCUSSION

The stool examination revealed that the prevalence of STH infection in the research location was high. Eighty-three out of 126 (65.9%) were positive for STH infection. It is quite high than the prevalence of STH infection in Indonesia. [6] It will need an intense prevention program [7,15] to achieve the target that set by Indonesian government. [7] Beside that, there were only 35 children that willing to be included as sample in the study.

Papaya is one kind of plant that thrives in West Sulawesi. The utilization of this fruit generally remained as a food source, not made as an alternative treatment materials. This is due to the lack of knowledge and lack of information about the use of papaya plants as herbs. Papaya contains alkaloids karpainin, karpain, pseudokarpain, vitamin C and E, choline,

and karposid. [10,11] While papaya seeds have antibacterial activity because it contains alkaloids (karpain) capable of inhibiting the growth of bacteria. Karpain is ringed alkaloid laktonat with 7 groups of methylene chains so potent to hinder the performance of some microorganisms. [11]

Each of the content contained in papaya seeds have different functions, particularly those related to health improvement. Among the content of papaya seeds that can be used as a medium for the treatment of intestinal worms is alkaloid. In the alkaloid, there is karpain, [16] that can digest microorganisms protein and converting it into a derivative compound called peptone. [11]

The results showed that there is no difference in the effectiveness of papaya seeds which dried for 2 hours, 3 hours and 4 hours at a temperature of 50°C. Results of other studies also indicate that the papaya seeds are more effective in killing the intestinal worm. [17] This study is also inline with Ambarwati which concluded that papaya seeds flours were effective as natural anthelmintics in school-age children 6 - 12 years. [18]

In addition, another research also revealed that papaya seeds flour also made a significant contribution as an anthelmintic in killing *Ascaris lumbricoides*. [12] The level of effectiveness of anthelmintic in papaya seeds is strongly related to the temperature at the time of drying. The higher the temperature used to dry papaya seeds, the lower the alkaloid level. [19]

## CONCLUSION

The papaya seeds flour that dried for 2 hours, 3 hours, and 4 hours at a temperature of 50°C are effective as anthelmintic in school-age children.

## Recommendation

It is recommended to use papaya seeds flour as an alternative anthelmintic in the school-age children. There is a need further study of the use of papaya seeds flour as anthelmintic for all age groups.

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**Conflict of interest:** None.

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## REFERENCES

1. WHO. Soil-transmitted helminths infection. WHO. <https://www.who.int/news-room/fact-sheets/detail/soil-transmitted-helminth-infections>. Published 2019. Accessed October 7, 2019.
2. Mitra AK, Mawson AR. Neglected Tropical Diseases: Epidemiology and Global Burden. *Trop Med Infect Dis*. 2017;2(36):1-15. doi:10.3390/tropicalmed2030036
3. Crompton DW., Nesheim MC. Nutritional impact of intestinal helminthiasis during the human life cycle. *Annu Rev Nutr*. 2002;22:35-59. doi:10.1146/annurev.nutr.22.120501.134539
4. Lee J, Ryu J. Current Status of Parasite Infections in Indonesia: A Literature Review. *Korean J Parasitol*. 2019;57(4):329-339.
5. Lubis AD, Pasaribu S, Ali M, Lubis M. Effect of length of albendazole treatment against *Trichuris trichiura* infection. *Paediatr Indones*. 2013;53(5):245-249.
6. Ternyata Infeksi Cacing Salah Satu Penyebab Stunting. *Majalah CSR.id*. <https://majalahcsr.id/ternyata-infeksi-cacing-salah-satu-penyebab-stunting/>. Accessed October 7, 2019.
7. Ministry of Health of Republic of Indonesia. PMK No 15 Tahun 2017.; 2017.
8. Kumar NS, Ps SD. The surprising health benefits of papaya seeds: A review. *J Pharmacogn Phytochem*. 2017;6(1):424-429.
9. Sapaat A, Tun U, Onn H, Satrija F. Anthelmintic activity of papaya seeds on *Hymenolepis diminuta* infections in rats Anthelmintic activity of papaya seeds on *Hymenolepis diminuta* infections in rats. *Trop Biomed*. 2012;29(4):508-512.

10. A'yun Q, Laily AN. The Phytochemical Analysis of Papaya Leaf (*Carica papaya L.*) at The Research Center of Various Bean and Tuber Crops Kendalpayak, Malang. *Semin Nas Konserv dan Pemanfaat Sumber Daya Alam.* 2015;134-137.
11. Torar GMJ, Lolo WA, Citraningtyas G. Uji Aktivitas Antibakteri Ekstrak Etanol Biji Pepaya (*Carica papaya L.*) Terhadap Bakteri *Pseudomonas Aeruginosa* dan *Staphylococcus Aureus*. *Pharmacon J Ilm Farm.* 2017;6(2):14-22.
12. Agarti MB, Ibrahim M, Alfiana S, Sasturi SM. The activities of anthelmintic infusa of papaya seeds (*Carica papaya l.*) against worms *ascaris suum* (study in vitro). *J Bio Innov.* 2017;6(5):659-663.
13. WHO SEARO. Traditional Medicine in Republic of Indonesian.
14. Widowati L. The use of traditional health care among Indonesian Family. 2017;8(1): 30-35.  
doi:10.22435/hsji.v8i1.5600.Nurhayati
15. Saeni RH, Arief E, Gizi J, Kemenkes P. Having habit not washing hand related to STH incidence at school children in Mamuju Subdistrict. *J Kesehat Manarang.* 2017;3(1):38-43.
16. Alfarabi M, Fauziayuningtias DA. Analisis Nilai Toksisitas Ekstrak Biji Pepaya (*Carica papaya*) dengan Metode Brine Shrimp Lethality Test (BSLT) Toxicity Analysis of *Carica papaya* Seed Extract Using Brine Shrimp Lethality Test. *Nat Sci J Sci Technol ISSN.* 2017;6(2):2338-950153.
17. Muslimin WA, Alvita G, Permatasari AR, Tahir JN, Rina Masadah. Hasanuddin Student Journal. *Hasanuddin Student J.* 2018;2(1):189-202.
18. Ambarwati R, Marni M. Efektivitas Pemberian Bubuk Biji Pepaya (*Carica papaya*) Kering Sebagai Antihelmintik Alamiah Pada Anak Usia Sekolah Dasar. 2nd Univeristy Res Coloquium 2015. 2015:355-358.
19. Okeniyi JA., Ogunlesi TA, Oyelami OA, Adeyemi LA. Effectiveness of Dried *Carica papaya* Seeds Against Human Intestinal Parasitosis: A Pilot Study. *J Med Food.* 2007;10(1):194-196.  
doi:10.1089/jmf.2005.065

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