Borax Detector Chopsticks

Nanda Nickolla Bagus Adrian
nandanickolla36@gmail.com
Supervisor : Didik Purwaka, S. Pd., M. Pd.
SMA Negeri 3 Yogyakarta, Yogyakarta, D. I. Yogyakarta
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1. Introduction

There are many food sellers such as meatball and noodle sellers who cheat by adding borax in their food, so that the sold foods can last longer. However, borax has many negative impacts for our body. Borax can cause nausea, cancerr, and death.

Based on the data collected by BPOM in 2005, foodstuffs that using formaldehyde and borax are marine fish, wet noodles, tofu and meatballs. A research about meatballs in the city of Medan, from 10 samples of meatballs showed that 80% of the tested samples turned out contained borax and the levels of borax in meatballs can varied between 0.08% - 0.29% (Panjaitan, 2010).

Judging from the resource potential of the region, Indonesia has the potential availability of food as a source of carbohydrate that is quite large. One source of carbohydrates are types of tubers such as sweet potato (*Ipomoea batatas L*). Based on the observations in the field, initially yams that were encountered are sweet potato flesh color white, yellow and orange. However, since the introduction of two varieties of Japanese purple sweet potato with flesh colors are very dark is Ayamurasaki and Yamagawamurasaki has been cultivated commercially, the use of purple sweet potato growing has good prospects. In addition Balitkabi also has three purple sweet potato clones, namely MSU 01022-12, MSU MSU 01008-16 and 01016-19 (Yusuf et al., 2003).

The purple color on purple sweet potato is caused by the presence of natural pigments called anthocyanins. Purple sweet potato anthocyanin component is mono or diacetyl derivative 3- (2-glycosyl) glycosyl-5- glycosyl peonidin and cyanidin (Suda et al., 2003).

Tool that found in meatballs or noodles are chopsticks. Chopsticks are wooden chopsticks. Wood is a component that can absorb water. So that wooden chopsticks can absorb liquids.

When a chopstick soak in a extract of Purple Sweet Potato (anthocyanins) and reacted with acid, the color of chopstick turned, from purple into green.

Based on this, purpose of this research is to create a simple tool for the detection of borax in food using wooden chopsticks and anthocyanins in purple sweet potato.

2. Problem Statement

How the effectiveness of chopsticks for detecting borax.

3. The purpose of the investigation

This research aims to make a simple tool from wooden chopstick and purple sweet potato to detect borax in a food.

4. Research Method

This research was conducted by processing the purple sweet potato and wooden chopsticks into the borax detector chopsticks and to know the effectiveness of borax detector chopsticks.

The process is described as follows.

(1) Washing is done by cleaning the dirt attached to the purple sweet potato using water and repeated two times.
(2) The purple sweet potato then ground into smaller sizes.
(3) The smooth purple sweet potato then boiled with chopsticks for 4 times boiled. There are 30 minutes; 60 minutes; 90 minutes; 120 minutes. To know the color change of chopsticks.
(4) The chopsticks then dried in the sun for 1 days.
(5) The chopsticks then packed in the box
(6) Tests done by jabbing a chopstick into meatballs to tested the meatball and wait it for some time.

The process of boiled copsticks repeated 4 times to obtain representative data. And also use 4 concentration of borax. Tests of the effectiveness of borax detector chopsticks to find out the benefits of the products. The process of making chopsticks was done in Biological Laboratory of Senior High School 3 of Yogyakarta. Test has been conducted to 4 sample concentration of borax in meatballs, there are 5 gram of borax, 10 gram of borax, 15 gram of borax, and 20 gram of borax. Each concentration use 5 sample.

5. Results and Analysis

Boiling wooden chopsticks with extract of purple sweet potatoes aims to enable the absorption of anthocyanins into the pores wooden chopsticks. After boiled, wooden chopstickschopsticks dried approximately 1 day and ready to be used as borax detector chopstick.

Chopsticks colors after boiling:

	30 min	**60 min**	**90 min**	**120 min**
Discoloration	Light purple	Purple	Purple	Purple

Table 1, discoloration of chopsticks

Based on this, chopsticks boiled for 30 minutes, 60 minutes, 90 minutes, 120 minutes change the color of chopsticks to be purple. But, based on observation, chopsticks was boiled for 30 minutes got a color that is too bright and was boiled more than 60 minutes did not show significant result, because the color change nothing. So, result more effective is copsticks that boiled for 60 minutes. And used chopsticks that boiled 60 minutes to jabbed into meatballs

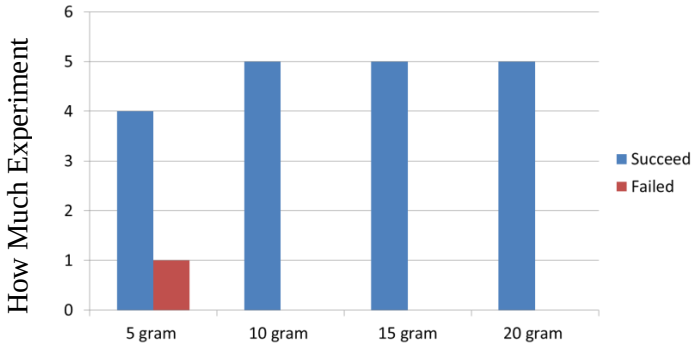
The test results jabbed chopsticks into meatballs can be seen in the following table.
Result of chopsticks:

B / C	None	5 g	10 g	15 g	20 g
60 min	None	Green	Green	Green	Green

Table 2, result of the chopsticks 60 minutes boiled

Based on result, chopsticks boiled for 60 minutes can used to detecting borax on meatballs using 5 gram, 10 gram, 15 gram, and 20 gram concentration of borax.

This following graph is result jabbed chopsticks in each concentrations and each concentrations used 5 samples of meatballs.



The Amount of Borax Concentration

Graph 1, experiment

The above graph shows that from 5 samples of meatballs each concentration can detected by chopsticks that boiled 60 minutes, because the color of chopsticks jabbed into the meatballs turned green. Only failed once when chopsticks jabbed into one sample meatballs that contained 5 gram borax.

6. Conclusion

Purple sweet potato and wooden chopsticks can be processed to make borax detector chopsticks. From the test, chopsticks that boiled 60 minutes and jabbed into meatballs contained borax from 5 gram, 10 gram, 15 gram, and 20 gram the color turned green.

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