Original Article

Test Hedonic (Colour, Smell and Strength) Toothpick Based Basic Tuber Sago, Tuber Ginger and Tuber Carrot in Users Orthodontic Fixed

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Abstract

Background: Toothpick is a tool to clean teeth from leftovers tucked in between the teeth. A toothpick that is often used is a stick made from wood. We also need to know that objects such as wooden toothpicks can be swallowed by chance and often occur. Agricultural tubers can now be processed into other alternatives for making environmentally friendly toothpicks because wood-based toothpicks can cause natural damage. Some plants that can be processed into toothpicks are sago (Metroxylon sago), ginger (Zingiber officinale), and carrots (Daucus carota). carrot bulbs and ginger tubers. The specific purpose of this research is to find out the most preferred type of plant seeds among sago tubers, carrot bulbs and ginger tubers based on organoleptic assessment (color, aroma, and strength).

Method: This type of research used in this study is experimental laboratory research. The research design used was a post test with control group design with samples in this study using 30% sago flour, 30% ginger flour, 30% carrot flour. The organoleptic test used was the hedonic test (preference test) of 15 panelists who were asked to respond to the parameters of color, aroma and breaking strength.

Results: The results showed that for the organoleptic assessment of the highest average color treatment found in carrot raw material, 2.73 with a standard deviation of 0.79. For the treatment of aroma, the highest average was found in the ginger raw material, 2.80 with a standard deviation of 0.67. And the highest average fracture treatment was found in ginger which is 2.33 with a standard deviation of 1.04.

Conclusion: The results of this study indicate that panelists prefer toothpicks made from ginger tubers rather than toothpicks made from carrot bulbs and sago tubers

Keywords: toothpicks, sago (Metroxylon sago), ginger (Zingiber officinale), carrots (Daucus carota), organoleptic test.

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1. INTRODUCTION

Today, most people use toothpicks to remove and remove leftover food that is tucked between the teeth. The community uses toothpicks because of the lack of knowledge about oral health and the effects that will result from the use of toothpicks.1

Toothpick is a tool to clean teeth from food left behind between teeth, but a toothpick can negatively impact the soft tissue around the tooth so that it can cause inflammation of the soft tissue of the oral mucosa, create distance between teeth, damage tooth enamel, bad breath, and damage tooth roots.1 Toothpick that is often used is a stick made from wood. Dental conditions that occur due to the habit of using a toothpick are strokes on the crown of a tooth. It can even worsen dental caries. Moreover, if the toothpicks used are not controlled hygiene. This behavior is also reflected in the habits of the people before the modern era in the use of toothpicks. The material used in the past was strands from grass.2

We should also know that objects such as wooden toothpicks can be swallowed by chance and often occur. Swallowed toothpick will pass through the gastrointestinal tract without complication and have a high risk of perforation of the gastrointestinal tract, especially in the duodenum. In addition, perforation or penetration by a toothpick can be asymptomatic, and cause complications in adjacent structures such as fistulas involving major blood vessels, constrictive pericarditis, or abscesses liver.3

Another impact that occurs due to the use toothpicks is that of wood-based if food scraps and leftovers toothpick are disposed of anywhere will provide fatal pain in the mouth and throat when ingested by animals that use food scraps as feed ingredients. Thus waste food must be carefully handled to protect livestock and also to prevent environmental pollution. If most of the leftover food is disposed of in a bad way ie thrown away or discharged by water, it will cause not only pollution environmental but also endanger health.

Agricultural tubers can now be processed into other alternatives for making environmentally friendly because toothpicks wood-based toothpicks can cause natural damage. Some plants that can be processed into toothpicks are sago (Metroxylon Sago), ginger (Zingiber officinale), and carrots (Daucus Carota).

Materials And Methods

This is a laboratory experimental research, with a sample of 15 people who use fixed orthodontics which fulfills the inclusion criteria. The research design used was post-test with control group design for those who use fixed orthodontics. Sampling was carried out using a non-probability sampling technique, namely snowball sampling. Data were obtained through the use of toothpicks by the panelists and then gave their assessment on a questionnaire. The statistical test used the ANOVA analysis test with a significant value of $p < 0.05$.

The material used was a questionnaire given to the panelists about the level of preference for toothpicks made from sago seeds, ginger seeds and carrot seeds. The level of preference is divided into 3 categories, such as color, aroma and strength which are assessed based on the use of toothpicks by the panelists by scoring on the questionnaire with a value of 1 if you really don't like it, score 2 if you don't like it, score 3 if you like it a little, value 4 if you like and 5 if you really like each of the basic ingredients of the toothpicks.

This study was approved by the Ethics Committee, Faculty of Dentistry, Hasanuddin University based on attachment Number: 0242 / PL.09 / KEPK FKG-RSGM UNHAS / 2019.

Research Results

An examination has been made of organic toothpicks from tubers as an alternative to plaque cleaning in fixed orthodontic users at the Laboratory. Laboratory of Food Product Development of the Faculty of Agriculture, Hasanuddin University in September 2019. The type of research conducted was an experimental laboratory with are search design. post test with control group.

The sample in this study used 30% sago flour, 30% ginger flour, 30% carrot flour. This research was started by making tubers toothpicks. Then the test using organoleptic test as follows

Organoleptic test used is the hedonic test (preference test) of 15 sample who were asked to give a response on the level of preference for on toothpicks tubers based. The degree of preference is called the hedonic scale. In this study, samples that were carried out by hedonic tests including colour, aroma and parameters fracture in general can be seen in the following table.

Table 5.1 Results of Organoleptic Assessment of Colour, Aroma, and Specific Strength of

Type of tuber		Colour	Smell	Strength
Sago	Mean	2,60	2,60	1,73
	SD	0,82	0,82	0,45
Ginger	Mean	2,33	2,80	2,33
	SD	0,81	0,67	1,04
Carrot	Mean	2,73	2,60	1,80
	SD	0,79	1,80	0,67
Score p*		0,400	0,703	0,075
aShapiro Wilk Test; All data yields a value of p = 0,000; Value of p <0.05 Data not normally distributed.				
* * *Kruskal Wallis Test; P value <0.05; Significant data				

In table 5.1 it can be seen that for organoleptic assessment of treatment colour with the highest average found in carrot raw material which is 2.73 with a standard deviation of 0.79. For the treatment of aroma, the highest average was found in the ginger raw material, 2.80 with a standard deviation of 0.67. And the highest average fracture treatment was found in ginger which is 2.33 with a standard deviation of 1.04.

Based on the Shaphiro-Wilk statistical test to determine the normality distribution, the value of $p = 0,000 < 0.05$ means that the data is not normally distributed so the test is continued with the non-parametric test, Kruskal Wallis (Table 5.1). Based on the

Kruskal Wallis test, the p value for each treatment is at 0.05 so that there is no significant difference in the colour treatment of sago, ginger and carrots, there is no significant difference in the aroma treatment of sago, ginger and carrots and there is no significant difference breakage in sago, ginger and carrots.

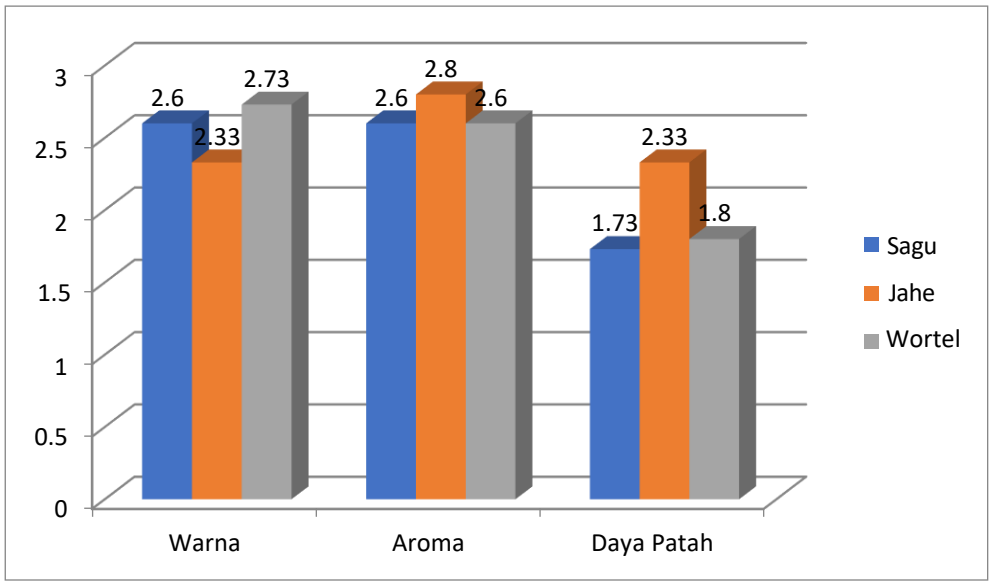

Chart 1. Averaging Results of Organoleptic Assessment of Colour, Aroma and Durability of Materials Sago, Ginger and Carrot

Tables 5.2 Results Of Statistical Tests Mann Whitney Assessment Appearance Colours, Smells, and The Power

Variabel	Type of Tuber	Sago	Ginger	Carrot
Colour	Sago	-	0,375	0,656
	Ginger	0,375	-	0,375
	Carrot	0,656	0,375	-
Smell	Sago	-	0,469	1
	Ginger	0,469	-	0,469
	Carrot	1	0,469	-
Strength	Sago	-	0,038*	0,813
	Ginger	0,038*	-	0,064
	Carrot	0,813	0,064	-
*Uji Mann-Whitney Test; Nilai P <0.05 ; Data signifikan.				

* Mann-Whitney Test; P value <0.05; Significant data.

Based on the results of further tests in table 5.2, it can be seen that the comparison has a significant value that is only found in the treatment of fracture ratio between sago and

ginger (p value = 0.038). This shows that there are significant differences between the average endurance in the sago and ginger groups.

The Mann-Whitney Test is a non-parametric test used to determine the difference in the median of 2 independent groups if the dependent variable data scale is ordinal or interval/ ratio but not normally distributed.

Table 5.3 Results of the best treatment analysis

Group	Mean	SD	Score p
Sago	2,31	0,82	0,6
Ginger	2,48	0,86	
Carrot	2,37	0,83	

Table 5.3 shows the comparison of the mean in each group, the results

Highest analysis show the ginger group had the highest average of 2.48 with a standard deviation of 0.86.

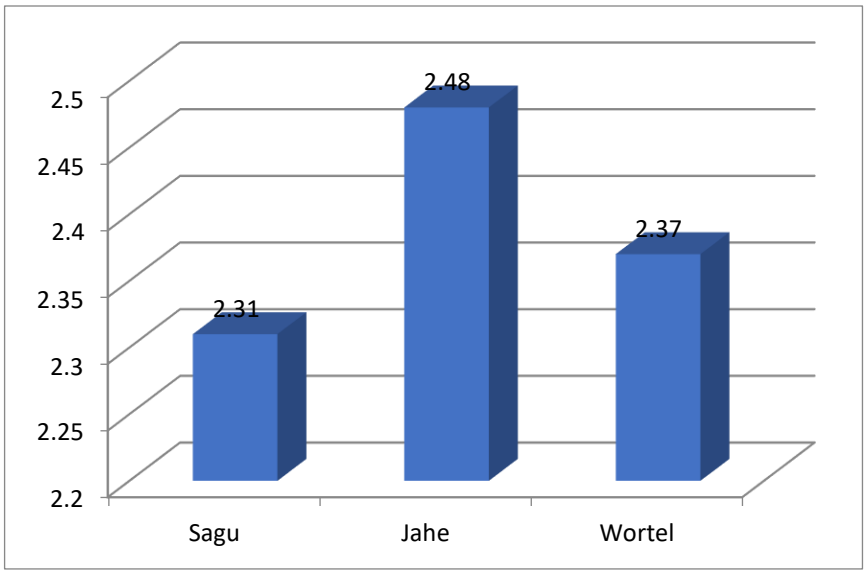

Chart 2. Average Results of the best treatment analysis

Discussion

Plaque is a thin layer covering a tooth containing germs 100 times more than in saliva. Dental plaque generally consists of 80% water and 20% solid material. Solid material consists of organic substances. Factors that influence the process of dental plaque formation are physical environment, food, saliva, and time. The physical environment includes the anatomy and arrangement of the teeth, the anatomy of the tissues around the teeth and the surface structure of the teeth. Plaque is a den of germs in the form of toxins, enzymes, and antigens and can cause inflammation of the gums. Mineralization can cause plaque to harden into tartar. The number of plaque and tartar shows the poor oral hygiene of the person.18 Plaque control can be carried out by mechanical action by brushing teeth and the use of other assistive devices such as dental floss, toothpicks and interdental brushes and chemical action by using antibiotics and other antibacterial compounds besides antibiotics.19

Toothpicks are aids to clean teeth before the discovery of a toothbrush. Improper use of toothpicks can cause sores and bleeding in the gums. The habit of using toothpicks in a manner striking or piercing can disrupt the supporting tissues of the teeth and can cause inflammation of the gums.20 It is easier use a toothpick to pick up to food scraps between your teeth than to use a toothbrush after eating. Dental conditions that occur due to the habit of using a toothpick are strokes on the crown of a tooth. It can even worsen dental caries. Even more so if the toothpicks used are not controlled for hygiene, such as the use of wooden toothpicks.2

The purpose of this study is to determine the making of toothpicks from tubers that are safe for the body and environmentally friendly as an alternative to plaque cleaning, so that the results of this study can be contributed to add knowledge useful, especially for patients using orthodontics.

This study uses 3 toothpicks made from tubers which are shaped to resemble toothpicks in general, each of which is

basically made from the type of sago, ginger, and carrots. Each toothpick material will be given an evaluation which is divided into 3 categories: colour, aroma and strength. Toothpick testing is carried out by a panel of 15 people who give assessment an objective.

Colour is one of the quality factors of a food. Colour is one part of product appearance and is an sensory rating parameter important, because it is the nature of sensory valuation that is first seen by consumers. If the appearance of the product is good or liked, then the new consumer will see the other sensory assessment characteristics (aroma, taste and texture).21 In the research conducted obtained the results of Organoleptic assessment of Colour, Aroma, and breaking strength, the average results can be seen in Table 5.1. The assessment of the treatment colour of the three toothpick samples found the highest average was found in the material Carrot raw which is 2.73 with a standard deviation of 0.79. This research is supported by a theory in a journal which says that the orange colour in carrots shows high carotenoid content and can be used as a food colouring natural. Carotene in carrots also acts as a precursor of vitamin A so that it adds value to the use of carrots as natural ingredients. Carrots have an attractive orange colour and a fresh aroma typical of carrots.22

Smell involves the sense of smell, the nose. Aroma is a parameter that influences the product acceptance, where the aroma of food will affect the level of uniqueness of the product. In the research conducted, for the treatment of aroma of the three toothpick samples found the highest average was found in the raw material of Ginger which is 2.80 with a standard deviation of 0.67. This is because the toothpicks served to the sample have the distinctive aroma of ginger added, where the ginger contains essential oils which produce a distinctive aroma of ginger. Volatile substances in ginger are responsible for the distinctive aroma of ginger. Essential oils are generally yellow, slightly viscous and are compounds that give a distinctive aroma to ginger.23

In the research conducted, for the treatment of the fracture power of the three samples the Tooth pick highest average was found in the raw material of Ginger which is 2.33 with a standard deviation of 1.04. In general, a toothpick that is considered good is a toothpick that has a fracture that is not easily broken (brittle), when used and broken with a finger, the toothpick is not easily broken. In this study this was evidenced in toothpicks made from ginger. This is due to the chemical

content in the ginger rhizome such as enzymes proteolyticin ginger which can cause the dough to be soft and not easily broken.24

Based on table 5.3 it can be concluded that shows the average comparison in each group, the highest analysis results show the ginger group has the highest average of 2.48 with a standard deviation of 0.86. Ginger (Zingiber officinale) is a plant whose rhizomes are widely used as spices in the manufacture of food and drinks. Many people who like the distinctive aroma of ginger, but ginger can also provide a sensation of spicy and warm taste. The aroma in ginger is caused by essential oils, the content of oleoresin which consists of gingerol and shogaol causes a spicy taste while the terpenoid derivatives in ginger such as sesquiterpen zingiberene also contribute to the sensation of warmth. There are three known types of ginger, namely large ginger, small ginger and red ginger. Red Ginger has many advantages compared to types other, especially when viewed in terms of the content of chemical compounds in the rhizome.24

In the oral cavity environment as well as the body in general, equipment and materials dental used must meet predetermined standards. Biologically, these tools and materials are not toxic to both patients and dental operators / nurses and dentists, do not irritate the oral cavity, do not cause allergic reactions and carcinogens. While chemically, it is not soluble in saliva and does not rust. Thus, toothpicks as an alternative to plaque cleaning from these tubers are considered to have fulfilled these elements so that toothpicks can be further developed from manufacturing procedures made from natural ingredients and are environmentally friendly.

Conclusions

The results of this study indicate that sample prefer toothpicks made from ginger tubers rather than toothpicks made from carrot bulbs and sago tubers.

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