

RESEARCH OF INSTANT POWDER DRINK DAYAK ONION (*Eleutherine Palmifolia*, (L.) Merr) AND PINEAPPLE (*Ananas Comocus* (L.) Merr)

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ABSTRACT

Instant powder drink is food processed in the form of powder, easily dissolved in the water, practical in serving and has a long shelf life because of its low water content. In this study instant powder drink were made using the raw material from the mixing of dayak onion juice with pineapple juice. This research used a completely randomized design (RCD) with 5 treatments and 3 replication. Data were analyzed statistically using ANOVA and continued with Duncan's New Multiple Range Test (DNMRT) at the 5% level. The treatment in this study was the mixing of dayak onion juice and pineapple juice in the formulation A (90:10), B (80:20), C (70:30), D (60:40), E (50:50). From the results of receiving the instant powder drink of dayak onion and pineapple juice ranges from usual preference to like. The most preferred treatment is treatment E with colour value of 3,25 (ordinary), aroma of 3,65 (like) and taste of 3,70 (like). The study aims to determine the best composition of instant powder drink in terms of organoleptic and chemical, physical and microbiological characteristic.

Keywords: dayak onion, instant powder drink, oven, pineapple

INTRODUCTION

Instant powder drink is food processed in the form of powder, easily dissolves in water, practical in serving and has a long shelf life because of its low water content. This instant drink can be produced using natural herbs that are nutritious for the body. One of the innovations of instant powder drinks can be made from dayak onions and pineapples. The processing of dayak onions into powdered drinks can increase the value of dayak onion products so that dayak onions can be better known to the wider community.

Dayak onions (*Eleutherine palmifolia* L. Merr) are well known as medicinal plants. This dayak onion plant is easy to find because it can be planted anywhere and the harvest time is relatively short, which is 2- 3 months. In the dayak bulb contains phytochemical compounds, namely alkaloids, glycosides, flavonoids, phenolics, steroids and tannins (Hidayah, *et al.*, 2015). These compounds can potentially be a source of antioxidants in the dayak plant.

Pineapple is one of the fruits that is high in vitamin C and also contains potassium, calcium, iodine, sulfur, chlorine, acid, biotin, vitamin B12, vitamin A and bromelain enzymes (Wati, 2010). In addition, pineapple is a food product that is easily available and also has a fairly affordable price. It is hoped that the bitter taste of dayak onions from saponin and tannin can be eliminated by interacting with other taste components so that it can reduce the primary taste (Latifaningsih, 2012). The combination of sugar and acid content is thought to minimize the bitter taste of dayak onions so that the addition of pineapple can improve the taste of the dayak drink and increase the vitamin C content and give the product a fresh effect.

MATERIALS AND METHODS

Materials

The material used in the manufacture of instant powder drinks is Dayak onions which are ready for harvest and are not damaged which are obtained in Payakumbuh. While the

pineapples used are honey pineapples with the sunpride brand that are ripe obtained from fruit sellers in the Padang market, maltodextrin (CV. Citra Kimia), tween 80, tropicana slim brand stevia sugar, the solution used for the analysis is distilled water, a solution iodine, starch indicator, DPPH, methanol and others.

The equipment used in processing are knives, scales, basins, blenders, aluminum spoons, mixers, trays. The equipment used in the analysis are pH meter, burette, beaker glass (pirex), measuring flask, measuring cup, dropper pipette, aluminum cup, oven, porcelain cup, erlenmeyer, filter paper, plastic container, cotton wool, desiccator, spectrophotometer (UV-1800, Shimadzu), stopwatch, aluminum foil, furnace, test tube, petridish and others.

Methods

Experimental Design

Research Methods This study used a completely randomized design (CRD) with five treatments and each treatment was repeated three times.

- A = 90% dayak juice: 10% pineapple juice
- B = 80% dayak juice: 20% pineapple juice
- C = 70% dayak juice: 30% pineapple juice
- D = 60% dayak juice: 40% juice pineapple
- E = 50% Dayak juice: 50% pineapple juice

Instan Powder Drink Production

The process making instan powder in this study by using foam matt drying method. Dayak onions and pineapples are blended and the juice is taken to be used as a base for making instant powder drinks. Dayak onion juice and pineapple juice are measured according to the formulation then mixed in a container. Then added 20% maltodextrin and tween 80 1% of the volume of Dayak juice and pineapple juice. Beat the mixture using a mixer for 10 minutes until foam forms. After that the foam is poured on a baking sheet that has been covered with aluminum foil.

The samples were then dried at tempering at 70°C for 8 hours. After drying the dry plates are mixed with stevia sugar and then mashed to become a powder and sieved with a 60 mesh sieve to homogenize the size of the powder. Then the powder is packed using a pp plastic clip. Meanwhile, the stages of making

instan powder dayak onion and pineapple juice can be seen in Figure 1.

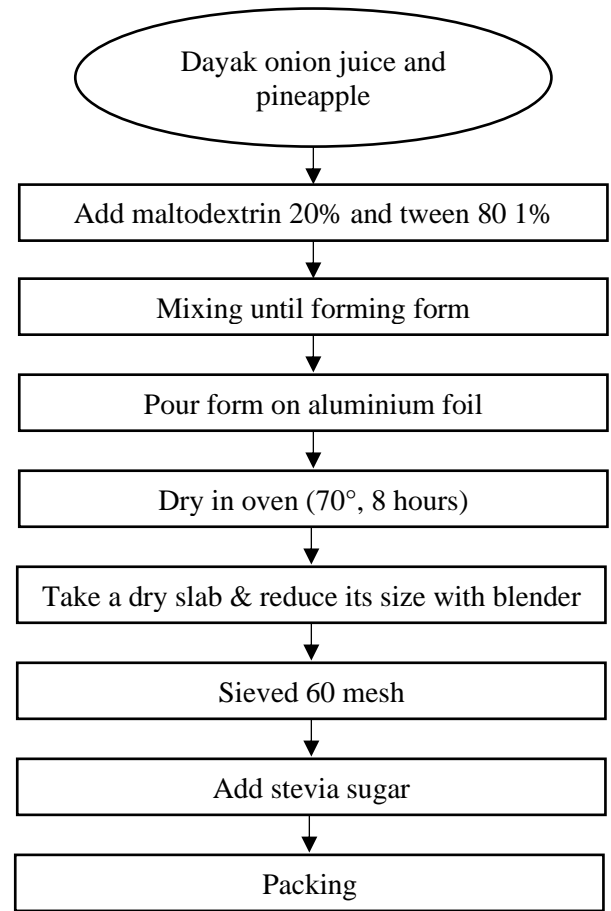


Figure 1. Flow chart of the process of making instan powder mixing onion dayak and pineapple juice

The analysis consisted of physical, chemical, microbiology and organoleptic tests. Physical analysis were Time Soluble in Water (Permata and Sayuti, 2016), Water Insoluble Section (SNI 01-2891-1992), chemical analysis namely Water Content using Gravimetric Method (AOAC, 1995), Ash Content (AOAC, 1995), Analysis of Antioxidant Activity with DPPH (AOAC, 2005), Vitamin C Levels (Sudarmadji and Suhardi, 1984), microbiological analysis, namely Total Plate Test (Fardiaz, 1993) and Organoleptic Test (Setyaningsih, 2010).

RESULTS AND DISCUSSION

Representation of the powder instan dayak juice and pineapple juice can be seen in Figure 2.

Physical Analysis

- a. Time For Soluble

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Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice is statistically significant ($\alpha < 0.05$) to the dissolving time of the instant powder drink produced. The fastest time to dissolve the mixing drink was found in treatment A (90% Dayak extract: 10% pineapple juice). Because product treatment A have low water content. Based on the research by Yohana (2016), the higher the water content of powder products, the more soluble time it takes for powdered drinks to dissolve in water, and vice versa, instant drink powder ingredients which have low water content are soluble in water.

b. Insoluble Portions

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice is statistically significant ($\alpha < 0.05$) to the insoluble material of the instant powder drinks produced. From the data above, it can be seen that the highest insoluble material was found in treatment A, namely 5.16%. This is because dayak onion have the

greatest water insoluble particles so that the more dayak onion juice is added, the higher the water insoluble material in the product.



(a)



(b)

Figure 2. Product of powder drink (a) in powder form (b) in solution form.

Table 1. Physical analysis

Parameter	Treatments				
	A	B	C	D	E
Time for soluble (second)	50.01 ± 0.84	52.89 ± 0.63	54.82 ± 0.77	57.03 ± 0.46	57.86 ± 0.34
Insoluble portions (%)	5.16 ± 0.27	4.78 ± 0.28	4.49 ± 0.16	4.38 ± 0.17	3.95 ± 0.32

Chemical Analysis

Variety of water content, ash content, vitamin c, antioxidants can be seen in Table 2.

a. Water content

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice is statistically significant ($\alpha < 0.05$) to the moisture content of the instant powder produced. From the data above, it can be seen that treatment E has the highest percentage of water content, namely 3.19%. The greater the addition of pineapple juice will increase the moisture content of the resulting powder drink. This is because the pineapple used in this study has a water content that is quite large, namely 88.26%, while Dayak onions have a water content of 59.22%.

Based on SNI 01-4320-2004, the maximum water content of powder drinks is 3%. In this study, treatments A, B and C already have water content according to SNI, while treatments D and E have not met the water content according to SNI.

b. Ash content

Ash is an inorganic residue which is obtained by ashing or heating at high temperatures > 450 ° C and / or decomposing organic components with strong acids. This inorganic residue consists of various kinds of minerals whose composition and amount depend on the type of foodstuff and the analysis method used (Yenrina, 2015).

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice is not statistically significant ($\alpha < 0.05$) on the ash content of the instant drink pollen produced. It can be seen from the data in the table above that the greater the addition of Dayak juice, the higher the percentage of ash content. Ismanto's research (2014) states that the addition of Dayak onions with the highest concentration in making nuggets produces a product with the highest ash content. This is due to the high inorganic mineral content in Dayak onions.

c. Activity of Antioksidan

Antioxidants are compounds that can inhibit free radicals. Free radicals in the body can cause various dangerous diseases, with the presence of antioxidant compounds in the body it can prevent disease. In this study, the free radicals that were inhibited by the sample antioxidants in the antioxidant activity test were DPPH (1,1diphenyl-2-picrylhydrazyl).

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice is statistically significant ($\alpha < 0.05$) on the antioxidant activity of the instant drink powder produced. The strongest antioxidant activity value was found in treatment A with an inhibition percentage of 32.84%. While the weakest antioxidant activity was found in treatment E with an inhibition percentage of 14.51%. With the

greater the concentration of Dayak juice in the manufacture of this powder drink will increase the antioxidant activity.

d. Vitamin C

Based on the analysis of variance, it shows that mixing Dayak onion juice with pineapple juice has a statistically significant difference ($\alpha < 0.05$) on the vitamin C levels of the instant powder drink produced. From the data in the table it can be seen that treatment E has the smallest vitamin C content, namely 115.68 mg/100g, while treatment A has the largest vitamin C content, namely 163.61 mg/100g. The more Dayak juice additions to making this powder drink will produce products that have high vitamin C levels. In Ismanto's research (2014) states that the higher the addition of Dayak extract, the higher the vitamin C levels in the nuggets.

Table 2. Chemical analysis

Parameter	Treatment				
	A	B	C	D	E
Water content (%)	2.84 ± 0.55	2.92 ± 0.59	3.00 ± 0.70	3.04 ± 0.25	3.19 ± 0.23
Ash content (%)	0.70 ± 0.05	0.65 ± 0.19	0.62 ± 0.15	0.61 ± 0.12	0.59 ± 0.16
Antioxidant (%)	32.84 ± 6.67	29.27 ± 6.82	21.52 ± 6.01	18.31 ± 4.05	14.51 ± 2.09
Vitamin C (mg/100g)	163.61 ± 8.82	151.66 ± 12.71	146.37 ± 10.82	129.41 ± 7.39	115.68 ± 10.82

Microbiological Analysis

Total Plate Count

The total plate count analysis results can be seen in the Table 3. The total plate count test in instant powder drinks is one way to determine the number of microbes present in a sample using PCA media. In the analysis of the total plate number of instant powder drinks, the pour method is used. From the table above, it can be seen that the instant powder drink which has the highest total plate number is in treatment E of 2.5×10^3 , while the lowest total plate number is in treatment B 1.9×10^3 . The results obtained in this study are in accordance with the established standards (SNI 01-43202004) which is a maximum of 3.0×10^3 cfu / g.

The total plate value is influenced by extrinsic factors, namely conditions in the environment and unhygienic handling and storage of raw materials or processed products, which can lead to contamination of raw materials or processed products with microbes

originating from the processing environment and during storage (Damongilala, 2009).

Table 3. Total plate count

Treatment	ALT (cfu/g)
A	2.4×10^3
B	1.9×10^3
C	2.0×10^3
D	2.4×10^3
E	2.5×10^3

Organoleptic Test

The result organoleptic instan powder drink test is shown in table 4.

a. Colour

Based on the analysis of variance, it shows that mixing Dayak onion juice with pineapple juice has a statistically significant difference ($\alpha < 0.05$) on the organoleptic value of the color of the instant powder drink produced. The highest average value was found in treatment A of 3.85, while the lowest average value of color organoleptic was found in treatment E of 3.25.

Based by the color of the instant pollen brew, the mixing of Dayak juice and pineapple juice is red. This is because the Dayak bulb is red in color, which indicates a high content of anthocyanin compounds. The addition of dayak onion juice make the colour of the powder drink is so getting red.

b. Aroma

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice has a statistically significant difference ($\alpha < 0.05$) on the organoleptic value of the aroma of instant powder drinks produced. The highest average value was found in treatment E of 3.65, while the lowest average value of organoleptic smell was found in treatment A of 3.15.

In the study, it was found that the greater the addition of pineapples, the stronger the aroma of pineapples was. According to Muljohardjo (1988) in Imanda, (2019) states that one of the losses incurred in the drying process is the loss of flavor compounds or volatile volatile compounds.

c. Taste

Based on the analysis of variance, it shows that the mixing of Dayak juice with pineapple juice has a statistically significant difference ($\alpha < 0.05$) on the organoleptic value of the aroma of instant powder drinks produced. The highest average value was found in treatment E of 3.70, while the lowest average value of organoleptic aroma was found in treatment A of 2.75.

Taste is influenced by several factors including temperature, chemical compounds, concentration and interactions with other taste components. The taste with added more pineapple more likely because with the addition of more pineapple juice, make the bitter component in dayak onion juice is getting less, so that the sour taste in pineapple can mask the bitter taste of dayak onion. The taste of this instant powder drink also comes from stevia sugar which gives it a sweet taste. The sweet taste produced by stevia comes from stevioside compounds which are non-carcinogenic natural sweeteners. These stevioside compounds are generally found in the leaves of the stevia plant (Noor and Isdianti, 2013 in Imanda, 2019).

Table 4. Organoleptic test

Parameter	Treatment				
	A	B	C	D	E
Color	3.85 ± 0.93	3,50 ± 0.76	3.45 ± 0.76	3.25 ± 0.59	3.25 ± 1.02
Smell	3.15 ± 0.59	3.15 ± 0.75	3.25 ± 0.57	3.30 ± 0.55	3.65 ± 0.93
Flavor	2.75 ± 1.12	2.90 ± 0.85	3.15 ± 1.09	3.50 ± 1.00	3.70 ± 0.98

Note: 1 = very disliked, 2 = disliked, 3 = ordinary, 4 = liked, 5 = very liked

CONCLUSION

Based on this research, it was found that at product acceptance based on organoleptics, the best treatment was chosen which was the formulation dayak onion juice : pineapple juice (50:50) product with a color value score (3.25), smell (3.65), taste (3.70), as well as the results of physical, chemical and microbiological analysis of the product, namely water soluble time of 57.86 seconds, the insoluble portion of 3.95% water, 3.19% moisture content, 0.59% ash content, 14.51% antioxidant activity, 115.68 mg / 100g vitamin C content, and a total plate number of 2.5 x 10³. In this study the mixing of Dayak juice with pineapple juice had a significantly different effect on water content, water solubility time, water insoluble portion, antioxidant activity, vitamin C levels in the instant powder drink produced, but did

not significantly influence the ash content analysis.

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