World Journal of Engineering Research and Technology
WJERT
www.wjert.org
SJIF Impact Factor: 5.924

PHYSICAL QUALITIES, PROXIMATE ANALYSIS AND CONSUMERS ACCEPTABILITY OF RIMAS (ARTOCARPUS ALTILIS, PARK FOSB) CATSUP

***[1]Norma M. Duallo and [2]Ma. Fatima D. Mergildo**

[1]School of Technology and Computer Studies Biliran Province State University. Main Campus P.I Garcia Street Naval, Biliran Province.

[2]School of Arts and Sciences Biliran Province State University. Main Campus P.I Garcia Street Naval, Biliran Province.

Article Received on 26/11/2021 **Article Revised on 15/12/2021** **Article Accepted on 05/01/2022**

***Corresponding Author**
Dr. Norma M. Duallo
School of Technology and Computer Studies Biliran Province State University. Main Campus P.I Garcia Street Naval, Biliran Province.

ABSTRACT

Rimas (Artocarpus Altilis Park Fosb) Catsup were subjected to physical proximate analysis following AOAC standard method of analysis. And the results were also subjected to consumer acceptability. Rimas Catsup got a pH of 3.88, TTA of 0.76%, TSS of 22.0 Brix with a viscous consistency and a very fine and smooth composition of rimas catsup is much better than its counterpart, although To got higher dry matter, ash, crude fiber content, however T4 got higher crude protein and moisture content of 0.84 and 74.54% respectively. Results revealed that out of 100 respondents, only 39% signified they like the newly developed rimas catsup and 15% disliked the product. For commercial catsup obtained the highest acceptability score with 41% respondents signified they like the commercial catsup. While there were 5% disliked the commercial catsup. Results further suggests that processing rimas catsup is technologically possible and economically feasible.

KEYWORDS: rimas catsup, physical qualities, proximate analysis, consumer acceptability.

INTRODUCTION

Rimas (Artocarpus Altilis Park Fosb) is a native tree of Tahiti the Indo Malaysian Archipelago, East Indies and Polynesia. It was brought to the country by travelers and raised by the native people.[6]

Rimas (Artocarpus Altilis Park Fosb) is considered a staple food in other countries, particularly in the Pacific Archipelago because if prepared properly they make a good substitute for bread. In the country, it is among the most neglected fruits. They are grown mainly in the backyard and while no statistics on the number of trees grown in the country is available it is certain that there are many of them existing.[2]

Furthermore, Rimas (Artocarpus Altilis Park Fosb) is one of the indigenous fruit crops abundant in the locality particularly in coastal areas which are considered unexploited and unexplored. As per observation rimas bears fruit all year round and in most cases the fruits are just wasted. Rimas possesses a great potential for processing because of its unique physico-chemical properties and starchy nature. It is therefore possible to utilize rimas for catsup production.[5]

Tomato is an excellent material for catsup production. But the high cost, the seasonality and limited ecological adaptability of the crop is one of the factors that contribute to the relatively high cost of pure tomato catsup comparable to its counterpart.[4]

However, banana is one of the alternative materials for catsup making, considering the fact that it is used as staple food. In some parts of the country, great volume is processed into fried chips and flour. Therefore, only a certain percent of the banana produced is utilized for catsup production.

The demand for catsup is considerably high. Hence, there is a need for existing and prospective processors to search for readily available substitute raw materials to assure continues processing of the product and to lower the cost of producing it possible without changing its sensory qualities.[1]

Moreover, Rimas (Artocarpus Altilis Park Fosb) is one of the potential raw materials for catsup making. It is a fast growing and early fruiting indigenous fruit that adapted to coastal areas like Leyte. Its “prolific and year long fruiting habit” has made rimas a good source of

human food. Considering that it is a starchy nature then it is a potential raw material for catsup production. Its high protein and low-fat content is an added factor that makes rimas catsup a healthy food.[3] These observations have prompted the researcher to undertake this research to open up and venture new door of opportunity for those who may wish to engage in the production of rimas catsup.

Finally, results of this study provide also a promising opportunity for Filipino farmers to plant and raise potential commercial crops like rimas thus stimulating agricultural development in the countryside.

EXPERIMENTAL SECTION

Sample Collection and Preparation

Fresh and mature rimas were used in this study and time between harvest and processing was minimized to prevent biochemical changes in the fruit that could possibly affect the product quality.

The fruit were freshly harvested and thoroughly washed, sliced, core removed and steam cooked for 25 minutes after which was ground in the Udy Cyclone Mill with 80-mesh screen. Store sample in coin envelope, ready for analysis.

Ash Determination. One hundred milligram (100 mg) of well-mixed powdered sample was weighted and directly tarred using crucibles. Ignited at 650˚c in a muffle furnace unit sample particle turned to light gray ash. Cooled in desiccator to room temperature and weight. Calculate as:

$$\% \text{ Ash} = \frac{\text{weight of ash}}{\text{weight of sample}} \times 100$$

Crude Fat

One gram of freshly dried sample was weighed and placed in pre-weighed filter paper pocket. Secure both ends by stapling the folds and defatted in Soxhlet fat extractor using anhydrous hexane or petroleum other as solvent for 16 hours. The filter paper pocket plus under the hood until they are hexane or ether-free. Removed staple of the fold was heated for one (1) hour at 105˚c. The sample was allowed to cool on desiccator for one hour and weighed defatted sample plus the paper. The residence was reserved for fiber analysis. Calculate % fat as shown below.

wt. of sample + filter paper before defatting - wt. of defatted and over-dried sample + filter paper.

$$\% \text{ Fat} = \frac{\text{wt. of sample + filter paper before defatting - wt. of defatted and over-dried sample + filter paper.}}{\text{wt of sample}} \times 100$$

Crude Protein: Fifty milligram of sample and 0.5 gram of catalyst was carefully weighed, mixed well and added with 0.2 ml concentrated H_2SO_4 making sure the acid wets all sample particles. Using microkjeldah / digester the setting at 6 sample was digested for 20 minutes and allowed to cool. The mixture was diluted with distilled water and loosely covered with rubber stopper, immersed in ice-bath to hasten cooling of solution and the contents was poured into distillation apparatus. The flask was rinsed 3 to 4 times and 10.0 ml NaOH solution was added to the distillation still. The mixture was distilled using 10 ml distillate was collected and cooled, titrated to gray end point with standardized 0.02 NHCL.

Calculation

$$\%N = \frac{(NHCL)\ (VHCL\ /S - VHCL/b)\ (14/1000)}{W\ sample} \times 100$$

Where: conversion factor = 6.25

% Crude Protein = % W x 6.25

Crude Fiber: Fifty (50) milligram moisture-fat-free powder was weighed into 50 ml tube. Twenty-five milligram asbestos, and a drop of Octanol was added to 10 ml boiling H_2SO_4 solution. Mixed gently to wet all powder. The tubes were covered with glass marble. It was transferred to vigorously boiling water bath and boiling continued for 30 minutes. Timing started as soon as solution in tube starts to boil and centrifuged at 5,000 x gram for 10 minutes. Timing started as soon as solution in tube starts to boil and centrifuged at 5,000 x gram for 10 minutes. The supernatant was discarded and the residue was washed with boiling distilled water. The process was repeated until residue become acid-free. The acid-free residue was digested with 10 ml boiling NaOH solution as above. The residue was centrifuged and washed with boiling distilled water until it was alkali-free. The residue was transferred to prepared gooch crucible and processed as in the standard method. Percent crude fiber was determined using the standard formula.

Weight of crude fiber = wt of crude + sample after wt of crucible + sample Oven drying after ignition

% Crude fiber = weight of crude fiber x 100
weight sample

Carbohydrates: The amount of carbohydrate substance excluding cellulose is referred to as to nitrogen-free extract (NFE). This value was obtained by subtracting the sum of the percentages of moisture, ash, crude fat, crude protein and crude fiber from 100. Calculation for carbohydrates content is shown below.

% Carbohydrates = 100% - (% moisture content + ash + % fiber + % protein)

Consumer Acceptability

Formulation acceptable among laboratory panelists were subjected to consumer evaluation. Respondents were given rimas catsup together with the commercial sample for testing. Using consumer respondents were requested to give their honest assessment of the product.

RESULTS AND DISCUSSION

Physical Qualities: The physical qualities of rimas catsup was done in order to evaluate the (pH) acidity (TTA), total soluble solid (TTS), viscosity and texture as presented in Table 1.

Table 1: Physical Qualities of Catsup as Affected by the Levels of Rimas in the Formulation.

Treatment	pH	TTA (%)	TSS (˚B)	Viscosity	Texture
To	4.02	0.76	31.0	Very Viscous	Rough
T1	3.96	0.76	29.5	Very Viscous	Slightly Rough
T2	3.89	0.86	28.5	Very Viscous	Smooth
T3	3.88	0.84	25.0	Viscous	Fine and smooth
T4	3.88	0.76	22.0	Viscous	Very fine and smooth
The level of rimas in the formulation affect the physical qualities of the product.					

As shown in Table 1, T4 and T3 got the same pH value of 3.88 which is considered “acidic”. Incorporation of banana in the formulation somehow increased the pH of to which fall under the “moderately acidic” level. The decrease in pH level of pure rimas catsup can be due to the fact that rimas contain fair amount of ascorbic acid. The presence of ascorbic acid in rimas is advantageous as far as production of catsup is concerned for it implies that incorporation of vinegar into the formulation can be minimized thus production cost can be reduced.

For titrable acidity, no definite pattern was observed. As presented in Table 1, T4, T1, and T0 got the same titrable acidity of 0.76 and T3 got titrable acidity of 84% respectively. While T2 got the highest titrable acidity of 0.86 among the treatments. The difference in % titrable acidity can be attributed to the difficulty in determining the color change during the titration process due to the presence of food grade color in the catsup. Although difference in titrable acidity was noted, however it is very negligible and considered insignificant.

In terms of total soluble solid, it was noted that increasing the levels of rimas in the formulation lowers the TTS of the product of the treatments evaluated, T4 got the lowest TSS of 22˚ B while T0 got the highest TSS of 31˚ B. The high TSS in T0 is due to the high amount of sugar in banana compared to rimas especially that ripe banana was used in the formulation.

Product viscosity was found affected by the levels of rimas in the formulation. It can be gleaned from Table 1 that T4 and T3 got a viscous consistency while T2, T1 and T0 got a very viscous consistency. In terms of texture, T4 catsup with rimas in the formulation go a very fine and smooth texture compared with control (T0). The findings gave the researcher and idea that rimas has a very unique starch quality which is potential raw material for catsup production.

Table 2: Proximate Composition of Catsup as Affected by the Levels of Rimas in the Formulation.

Proximate Composition						
Sample						
T0 – 100: 0	67.26	32.74	5.38	0.61	2.04	1.10
T1 – 75: 25	73.03	26.97	3.31	0.46	1.61	0.07
T2 – 50: 50	73.99	26.01	5.13	0.41	1.62	0.09
T3 – 25:75	73.67	26.33	3.88	0.76	1.39	0.12
T4 – 0:100	74.54	25.46	2.93	0.84	.28	0.09

Table 2 disclose the proximate composition of catsup as affected by the levels of rimas in the formulation. In terms of moisture T4 (100% rimas) has the highest percentage moisture content of 74.54 percent. It is followed by T2 = 73.99, T3 = 73.67, T1 = 73.03 while T0 (control) gave the lowest percent moisture content of 67.26%.

With regards to dry matter, it was observed that the T0 (control) got the highest dry matter content, with a value of 32.75 percent, T1 had a dry matter of 26.97 percent, T2 26.01, T3 =

26.33 and T4 (100% rimas) had a lowest dry matter content of 25.46 percent. This is due to the fact that T0 (control) got the highest percentage dry matter content.

In terms of ash, laboratory results showed that T0 as analyzed got the highest ash content of 5.38% while T4 got the lowest ash content of 2.93 percent.

For crude protein content T4 got 0.84% which is considered the highest among treatment evaluated followed by T3, T0, T1 and T2 crude protein content is 0.76, 0.61, 0.46 and 0.41 percent respectively.

Regarding crude fat, as expressed as either extract (EE) content, T0 got the highest present either extract (EE) which is 2.04 followed by T2 = 1.62, T1 = 1.61, T3 = 1.39 and T4 got the lowest either extract (EE) value of 1.28 percent.

The crude fiber content of rimas catsup was observed highest in T0 = 1.10, while T3 = 0.12, T4 and T2 got the same crude fiber content of 0.09 and T1 had the lowest crude fiber content of 0.07 percent.

Consumer Acceptability Towards Rimas Catsup. Table 3 shows the result of consumers acceptability of rimas catsup.

Table 3: Consumer's Acceptability Towards Rimas Catsup.

Sample	LIKE		DISLIKE		NO COMMENT		Total Respondents
	No. of Respondents	%	No. of Respondents	%	No. of Respondents	%	
RC (Rimas Catsup)	39	39	15	15	0	0	54
CC (Commercial Catsup)	41	41	5	5	0	0	46
							100

Results revealed that out of 100 consumers only 39% liked the newly rimas catsup and 15% of the consumers disliked the product. As depicted in the results above, 41% of the consumers scored they like the commercial catsup. While only 5% disliked the said catsup.

Result of consumers acceptability evaluation imply that more consumers conferred the commercial catsup. This can be expected since commercial catsup is a popular flavor enhancer throughout the world especially that it has been really a part of the Filipino diet.

Furthermore, some consumer commented that they not used to the flavor of the newly processed catsup. However, the texture and color is better than the commercial counterpart. One possible reason why the respondents disliked the rimas catsup, mainly because they were used to the flavor of popular commercial catsup while rimas catsup is totally new to them. In addition, some consumers were aware of the use of rimas in the catsup presented thus created a bias towards the developed rimas catsup.

CONCLUSION

Rimas catsup possessed physico-chemical qualities which is very much useful for rimas catsup production. Proximate composition of rimas catsup is relatively better than the control (T0). For rimas catsup can be a potential alternative for its commercial counterpart.

REFERENCES

1. Amestoso, Nilda Tuta. (1995) An Enterprise Plan on the Establishment of a Sweet Potato Processing Plants in Marcos, Baybay, Leyte.
2. Coronel, Robert E. (1983). Processing Fruits in the Philippines.
3. Duallo, Norma M. (2000) Development and Evaluation of Rimas (Artocarpus, Altiles Park Fosb) Catsup.
4. Gould, W.A (1974). Tomato Production Processing Quality and Evaluation. Westport. AVI Publishing Co.
5. Lauzon, R. D (2000). Quality Evaluation of Rimas Fruit. Unpublished Research Result.
6. Roberts-NKrumch L.B. et.al (1983). Breadfruit Propagation Studies at the University of the West Indies. Proceedings of the Sixth Annual Seminar on Agricultural Research, Rudranath Capildoe Learning Resource Centre, Couva, Trinidad and Tobago, 34.