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Chemistry Changes in Minimally Process Snake Fruit Variety Pondoh during Storage in Room Temperature which Coating Used Edible Coating from Starch of Jackfruit Seed

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Abstract. This research aimed to know the effect of jackfruit seed starch concentrates and natrium metabisulfit in edible coating to the chemistry changes in minimally process snake fruit variety pondoh during storage at room temperature. The target of this research to look into the phenomenon of chemical changes in minimally process snake fruit bar pound which coating with edible coating from the starch of jackfruit seed that contained anti browning agent during storage in room temperature. This research methods include starch extract from jackfruit seed and coat the fresh-cut with a starch of jackfruit seed that incorporation anti browning enzyme. Also, do the characterization of chemical changes in minimally process snake fruit variety pondoh during storage. This research use Complete Random Design with 2 factors.First factor is starch of jackfruit that consist 3 levels are (B1=1% b/v; B2=3% b/v; B3=5% b/v) and second factor is concentration of natrium metabisulfit that consist 3 levels are (N1=200 ppm b/$b_{\text{starch of jackfruit seed}}$; N2=400 ppm b/$b_{\text{starch of jackfruit seed}}$; N3=600 ppm b/$b_{\text{starch of jackfruit seed}}$) with 3 repetition. The result showed that giving edible coating from starch of jackfruit seed in level B2=3% b/v can defended sugar reduction rates of minimally process snack fruit variety pondoh at 4,01% and tanin rates at 0,08% but giving the natrium metabisulfit at all levels can't give real influences to chemistry changes of minimally process snake fruit variety pondoh.

Key-Words *: minimally process snake fruit variety pondoh,starch of jackfruit seed, edible coating.*

1. Introduction

People, lifestyle changes, make a food consumption pattern also changes that more practical and less long time preparation. That changes become a business opportunity for some businessman to offer the fruit product that's ready for consumption or minimally processed fruit in fresh-cut fruit. The problems that often come to the marketing of fresh-cut fruit is quality deterioration because of respiration process. [1], fruits still shelf-life until consumption. Respiration control is the critical factor to increase storage capacity. Respiration until fixed level can control wilted and putrefaction. In basic, fresh-cut fruits are the tissue that experience injured that easy to be softening and browning.

One of Indonesian local fruit with high commercial value is snake fruit. Minimally process fruit easy to be enzymaties browning reaction because of polifenolase enzyme activity and high polyfenol values. Browning reaction can be happened because there are contacts between polyfenol substract with oxygen after cutting that enzyme chataluzed. The previous research [2] showed that snake fruit without fresh cut have shelf life 6-7 days with high respiration.

Contact minimalist with oxygen is one way to hamper the respiration and browning reaction.Oxygen contact can reduce with coating use edible coating. [3], edible coating and edible films are made from natural polymers like polysacharides and protein. One of polysacharides that is used to be edible coating is starches. As far as the starch source is become from tuber like garut [4] and sweet potato [5],[6]. Alternative starches source has to be found especially starch source that uses optimally yet.

Malang is one of the city that produce specific food like jackfruit chips. One of the waste from jackfruit chip industry is jackfruit seed. Until now this waste use optimally yet. The result of research from [7], show that jackfruit seed contains a high starch value in 46,3% soit have the potential to be edible coating. Every jackfruit chip industry in Malang processing jackfruit until 5-6 ton and produce jackfruit seed about 180 kg everyday, so that the potential of jackfruit seed in Malang is very high.

Some factors that influence giving edible coating to cut fresh fruit is kind and concentrate of polymer also kind and concentrate of plasticizer [3]. The result of research from [6] and [5],the concentrate of flour influences the thickness of film coating that formed. [1], the thickness of film coating influences to the rate of oxygen transmission.

Edible coating on snake fruit is aimed to slow respiration down and to block enzymatic browning. [8], [9],[10],[11], edible coating can use to be barrier of additional food matter like dye, anti browning, anti microbial and antioxidant.In application on snake fruit must been investigation able of edible coating also able to be anti browning enzymatic carrier. Because of that reason in this research will be investigation incorporation effectivity of natrium metabisulfit to be anti browning enzymatic blocked apply in snake fruit performance that coat with edible coating from starch of jackfruit seed.

2. Research Methode

The research implementation in Engineer Process Laboratory of Tribhuwana Tunggadewi University and Food Quality Examination Laboratory of Brawijaya University Malang. The research stages are :

A. Starch of Jackfruit Maked

Remove peels and clean the jackfruit seed, cut the jackfruit seed becomes less, shatter the jackfruit seed with water 1:3, press and separate starch with waste, wash and separate between starch and water do twice until get the clean starch, dry the starch in 50^0C during 8 hours until water value at 12%, refine the starch that been dry and sift to get the same powder.

B. Coat the Snake fruit variety pondoh with Edible Coating Processed

Get the starch of the jackfruit seed with concentration 1% b/v; 3% b/v; 5% b/v, starch of the javkfruit and sorbitol was maked become suspension and then was heating on hot plate and was mixing on and on until the solution become clear at $72,5^0$C during 15 minutes, after that was added citrate acid into solution with concentration 1,75% (b/b $_{strach}$) and Na-metabisulfit with concentration 200 ppm b/b $_{starch\ of\ jackfruit\ seed}$; 400 ppm b/b $_{starch\ of\ jackfruit\ seed}$; 600 ppm b/b $_{starch\ of\ jackfruit\ seed}$ and then was mixing again. The cut fresh snake jackfruit was dipping into edible coating solution during 15 second with plastic net and then was wind drying with fan and then was entering onto paper box to storage in room temperature. There were 25 cut fresh snake fruit in every paper box.

Observation the quality changes and shelf life done every two days until the fruit, shoe the visual damage by 25 %. If the damage in the amount of 25% during storage until 7 days it means the shelf life of snake fruit is 7 days. Every 2 days make the observation into physic and chemistry changes are sugar reduction and tanin content.

This research uses Complete Random Design wit 2 factors. First factor is the starch of jackfruit seed with 3 levels are (B1=1% b/v;B2= 3% b/v;B3= 5% b/v) and the second factor is Na-metabisulfit with 3 levels are (N1=200 ppm b/b $_{starch\ of\ jackfruit\ seed}$;N2= 400 ppm b/b $_{starch\ of\ jackfruit\ seed}$;N3= 600 ppm b/b $_{starch\ of\ jackfruit\ seed}$) with 3 repetition, so there are 9 combonation treatments.

3. Results and Discussion

3.1. Sugar Reduction

One of the important chemistry characteristic that must be endured in fresh fruit storage is sugar reduction. To keep the sugar reduction level become important because can guard the sweetness level of the fruit during storage. The result of research showed that giving the edible coating from the starch of jackfruit seed in level 3% b/v can keep the sugar reduction rate of minimally process snake fruit variety pondoh but giving Na-metabisulfit doesn't give real influence to the sugar reduction rate of minimally process snakefruit variety pondoh. The sugar reduction rate of minimally processed snakes, fruit variety pondoh with an edible coating of starch of jackfruit seed and Na-matabisulfit can be shown on this table 1:

Table 1. Sugar Reduction Rate of Minimally Process Snake Fruit variety Pondoh From The Combination Between Edible Coating from Starch of Jackfruit Seed and Na-Metabisulfit in Fourth Days of Storage

B	N			Rate
	N1	N2	N3	
B1	3,91	3,93	3.95	3,93a
B2	3,99	4,05	4,00	4,01b
B3	3,98	3,95	3,98	3,98ab
Rate	3,96	3,98	3,98	

Information: Numbers that is followed by the same letter in the same coloumns show the no obvious different

The highest rate of sugar reduction is shown on level B2 (3% b/v starch of jackfruit seed) although that's not different with level B3 (5% b/v starch of jackfruit seed). At the same time, all levels Na-metabisulfit can't influence the sugar reduction of minimally process snake fruit varietypondoh. Hence, in this research, the sugar reduction just been influenced by the concentration of starch of jackfruit seed only. The higher of edible coating from the starch of jackfruit seed concentration can increase the rates of sugar reduction, but the higher of Na-matabisulfit concentration can't increase the rates of sugar reduction. It happened because sugar broken during respiration is pushed by oxygen readiness from air [12], that is meant the edible coating in level B2 (3% b/v starch of jackfruit seed) can blocked respiration rapid at fruit net so that the sugar degradation in fruit.

3.2. Tanin Rate

Tanin is one of special chemistry characteristic of sanke fruit. To defend the tanin rate of snake fruit to be important in order to the snake fruit have been storage didn't experienced over lowering of tanin rate. One of ways that can be done is coating the minimally process snake fruit with an edible coating of starch of jackfruit seed. The below table showed that giving edible coating from the starch of jackfruit seed in level B2 (3% b/v starch of jackfruit seed) can defend tanin rate of minimally process snake fruit and giving Na-metabisulfit in all levels can't influence tanin rate of minimally process snake fruit. The tanin rate of minimally process snake fruit can be shown on this table 2.

Table 2. Tanin Rate of Minimally Process Snake Fruit variety Pondoh From The Combination Between Edible Coating from Starch of Jackfruit Seed and Na-Metabisulfit in Fourth Days of Storage

B	N			Rate
	N1	N2	N3	
B1	0.06	0.06	0.06	0.06 a
B2	0.08	0.08	0.08	0.08 b
B3	0.06	0.06	0.06	0.06 a
Rate	0.07	0.07	0.07	

Information: Numbers that is followed by the same letter in the same coloumns show the no obvious different

Giving edible coating from starch of jackfruit seed in concentration 3% b/v can defend tanin rate of minimally process snake fruit because at this level the edible coating can block the respiration process so there is not a lot of oxygen that come in minimally process snake fruit finally tanin in snake fruit keep guarded and can't been oxidation, this reason was caused the tanin rate still high [13].

Tanin is a polyfenol that have sepat flavor and one of the special taste factor of snake fruit beside sweet and sour. Tanin can been changed by oxygen with oxidation, if tanin has been oxidation can changes became melanoidin so the colour and taste of cut fresh snake fruit also can be changed.

Conclusion

Giving edible coating from starch jackfruit seed into minimally process snake fruit on level B2 (3% b/v starch of jackfruit seed) can defend sugar reduction until 4,01% and tanin rate until 0,08%, but giving Na-metabisulfit in all levels can't influenced the sugar reduction and tanin rate of minimally process snake fruit.

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