

Original Research Article

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Effect Of Aloe Vera Coating On Quality Of Indo-Pacific King Mackerel(*Scomberomorus Guttatus*) Chunks During Chilled Storage

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ABSTRACT

Keywords

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In present study “Effect of Aloe Vera coating on the Quality of indo pacific-king mackerel fish Chunks during Chilled Storage” Indo pacific-king mackerel fish chunks were dipped in aqueous solution containing 25%, 50%, 75% and 100% Aloe vera Gel before chilled storage for 8 Days. Their physical (color and drip loss), biochemical (peroxide value), chemical (moisture) and organoleptic characters (textural) were analyzed. Both control and Treated Fish chunks samples were analyzed periodically. There were significant Differences between Coated fish chunks and the Control group in all parameters evaluated. Aloe vera at 75% and 100% concentration was able to prevent Lipid oxidation, PV and Drip loss properly. However, Coating containing 25% Aloe vera did not have the desired effect on characteristics. Fish chunk with higher concentration of Aloe vera had better Textural properties during chilled storage. Result also indicates the positive effect of aloe vera coating on the sensory quality of Fish Chunks.

Introduction

Fish is a superior food source, provides high quality of protein and wide variety of vitamins and other minerals. Even in small quantities, fish can have a significant positive impact in improving the quality of protein. There are so

many factors which affects the quality of fresh fish. Hence, to avoid or prevent the rate of spoilage so many techniques are available which reduce the chances of spoilage occurrence.

Indo-pacific king mackerel (*Scomberomorus*

guttatus) is a commercial fish species which is abundantly available in India, particularly in the lower sundarbans, west Bengal, madras, the gulf of mannar palk bay area and south of Bombay (Muchlisin, *et al*, 2009).

Aloe vera gel is one of the important bio-preservative which has a great potential to become a common use for most fresh fruits and vegetables. Aloe vera (*Aloe barbadensis*) belongs to the Liliaceal family with about 360 species. It is a cactus like plant that grows in hot and dry climates (Vogler and Ernst 1999). Fishes are more perishable foods than cereals and grains due to the higher amount of moisture content. To enhance the shelf life of the product; coating of aloe vera can be helpful which has anti-microbial activity and helps to avoid consumer health risks (Aldagal and Bazaraa 1999).

The coating of aloe vera has been used for enhancing the shelf life of tomato (Chauhan *et al*, 2013), apple slice (Song *et al*, 2013), mushroom (Mohebbi *et al*, 2012), sour cherry (Ravanfar *et al*, 2012) and many other fruits and vegetables due to its antioxidant and antimicrobial activities. In this method, a thin layer of aloe vera gel applied on indo-pacific fish chunks which helps to extend the quality of fresh fish and reduce the physical and chemical damages, also delays the microbial growth.

The main aim of this study was to investigate the effect of different concentrated of Aloe vera gel on the chunks of indo-pacific king mackerel during chill storage. Sensory analysis, chemical analysis and bio-chemical analysis of aloe vera coated fish chunks was analyzed during chill storage.

Materials and Methods

Fish (*Scomberomorus guttatus*, Indo-pacific king mackerel) were purchased from local

market of Veraval. The body scales were removed and completely dressed the fish manually. Cut the fish into small pieces (Chunks). The meat of the fish was stored into freezer at -18 ± 2 °C until use. Coating ingredient Aloe vera gel (*Aloe barbadensis*) was purchased from veraval market.

Generation of samples

Indo-pacific king mackerel chunks were selected for this study. Different concentration of aloe vera gel has been used to coat the product. Five batches of sample were prepared in which 0% (control), 25%, 50%, 75% and 100% of aloe vera gel was used. After coating the chunks, stored into chilled storage then analyzed it at 0 days, 2 days, 5 days and 8 days.

Analytical procedures

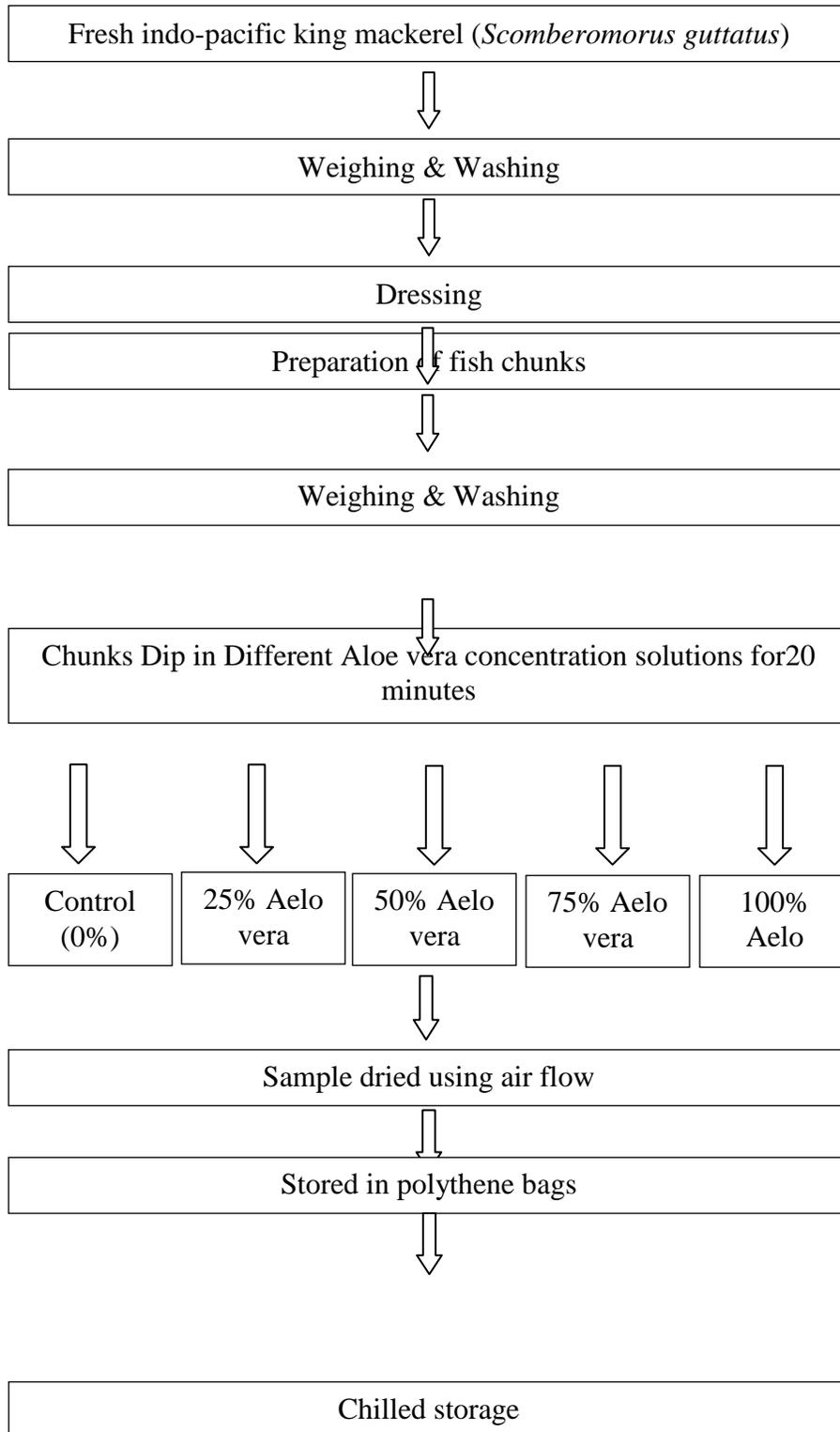
Determination of drip loss (%)

Drip loss of the treated and untreated fish fillets was measured according to the method; which was given by Sabow *et al.*, 2015. To measure the drip loss, take the fish fillet samples at 0 day were weighted and recorded as initial weight (W1).

The weighted samples were packed into polyethylene plastic bags, labeled, and stored into chilling storage. After 2, 5 and 8 day, the samples were removed from the bags, weighted and recorded as W2. Drip loss was measured and expressed as the percentage of difference between initial and final weight of sample after storage divided by the initial weight of the sample.

$$\text{Drip loss (\%)} = \frac{W1 - W2}{W1} \times 100$$

Flow chart of the process



Determination of peroxide value (meq/Kg)

The peroxide value is expressed in terms of mill-equivalent (meq) free iodine per kilogram of fat. It is determined by titrating iodine liberated from Potassium Iodine with Sodium thiosulphate solution. Thus, determination of peroxide value of fish fillets was done by chemical method (AOAC, 2006).

$$\text{Peroxide value (meq/1000 g)} = \frac{(S-B) \times N \times 1000}{W}$$

Where,

W = Weight of sample taken

S = Volume of sodium thiosulphate used for titration of sample

B = Volume of sodium thiosulphate used for titration of blank

N = Normality of sodium thiosulphate used

Sensory Evaluation

Nine member experienced panel of judges including teachers and post graduate students of Department of Fish Processing Technology

evaluated the samples for the sensory attributes viz. appearance, color, odor and overall acceptability using 9-point hedonic scale according to standard procedure (Peryam and Pilgrim,1957). Where, 9 = like extremely and 1 = dislike extremely.

pH evaluation

pH of the control sample(0% aelo vera coating) and coated samples was measured by using pH paper. For that, dipping the end of pH strip into the sample and after few second remove the strip to show the color change of the strip.

Instrumental color profile

Color profile was measured by using Color Reader CR-10 (Konica Minolta Sensing Inc. Japan), which has L*, a* and b* values. L* denotes lightness, a* (redness) and b* (yellowness) values were recorded on crushed kachoris kept in a group in the Petri plate. The equipment was standardized with a white color standard.

Table.1 Drip loss (%)

Physical analysis includes the yield or drip loss (%) of control and aelo vera treated Indo-pacific king mackerel chunks.

Storage days	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
2 nd day	6.81	6.69	4.80	4.32	3.88
5 th day	15.45	12.44	11.05	10.08	9.70
8 th day	29.54	22.48	20.19	19.45	15.53

Table.2 Peroxide value (meq/Kg)

Chemical analysis includes peroxide value (meq/Kg) of control and aelo vera treated (25%, 50%, 75% and 100%) Indo - Pacific king mackerel chunks.

Storage days	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
2 nd day	12.48	11.52	9.60	6.72	5.76
5 th day	18.24	16.32	14.40	11.50	7.68
8 th day	25.92	22.08	20.16	17.28	12.48

Table.3 Sensory evaluation (2nd day)
Sensory panel scores of control (C) and aelo vera treated (25%, 50%, 75% and 100%) Indo - Pacific king mackerel chunks

Quality attributes	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
Appearance	8	8	8	8	7
Texture	9	7	7	8	8
Color	8	8	7	8	8
Odor	8	7	7	7	7
Overall acceptability	8	7	7	8	8

Sensory evaluation (5th day)

Quality attributes	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
Appearance	7	7	6	6	7
Texture	6	6	6	7	8
Color	7	7	7	6	7
Odor	6	7	7	7	8
Overall acceptability	7	7	7	6	8

Sensory evaluation (8th day)

Quality attributes	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
Appearance	5	6	6	7	7
Texture	6	5	5	6	7
Color	5	6	6	6	8
Odor	5	6	6	6	7
Overall acceptability	5	6	6	6	7

Table.4 pH evaluation
 Biochemical analysis of control (C) and aelo vera treated (25%, 50%, 75% and 100%) Indo-pacific king mackerel chunks.

Storage days	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
2 nd day	7	7	7	6.5	6
5 th day	7	7	6.5	6	6
8 th day	7.5	6.5	6.5	6.	6.5

Table.5 Instrumental color profile
 Physical analysis of control (C) and aelo vera treated (25%, 50%, 75% and 100%) Indo-pacific king mackerel chunks.

Storage days	0% aelo vera (control)	25% aelo vera	50% aelo vera	75% aelo vera	100% aelo vera
2 nd day	L*= 57.2	L*= 47.4	L*= 48.4	L*= 50.9	L*= 59.8
	a*= -5.9	a*= -5.3	a*= -5.6	a*= -7.8	a*= -9.0
	b*= +16.0	b*= +12.7	b*= +12.4	b*= +12.9	b*= +14.5
5 th day	L*= 49.2	L*= 44.7	L*= 42.4	L*= 47.8	L*= 50.2
	a*= -8.8	a*= -9.3	a*= -9.3	a*= -6.9	a*= -8.11
	b*= +9.9	b*= +8.3	b*= +5.8	b*= +11.8	b*= +9.12
8 th day	L*= 36.2	L*= 39.5	L*= 41.8	L*= 45.4	L*= 45.5
	a*= -7.7	a*= -9.8	a*= -8.4	a*= -10.5	a*= -10.8
	b*= +3.2	b*= +5.5	b*= +8.3	b*= +4.8	b*= +7.6



Indo-pacific king mackerel



Weighing



Preparation of chunks



Fresh Aelo vera gel



Different concentration



pH paper



Measurement of pH



Measurement of color



Measurement of PV



Moisture meter



Measurement of moisture

The present study indicate that Aelo vera gel has significant effects on reducing the Peroxide value, drip loss and pH in chunks treated with high aelo vera concentration(100%). It has good acceptance in sensory attributes. Chunks coated with 100% aelo vera gel gave best quality during cold storage.

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