

Supplementary Materials: Sustainable antimicrobial and antioxidant coating for improving postharvest shelf-life of pineapple

Indra Bhusan Basumatary ¹, Avik Mukherjee ¹, Vimal Katiyar ², Santosh Kumar ^{1,*} and Joydeep Dutta ^{3,*}

¹ Department of Food Engineering and Technology, Central Institute of Technology Kokrajhar, Kokrajhar 783370, Assam, India; 023indra@gmail.com (I.B.B.); ak.mukherjee@cit.ac.in (A.M.)

² Department of Chemical Engineering, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India; vkatiyar@iitg.ac.in

³ Functional Materials, Department of Applied Physics, School of Engineering Sciences, KTH Royal Institute of Technology, AlbaNova Universitets Centrum, 106 91 Stockholm, Sweden

* Correspondence: s.kumar@cit.ac.in (S.K.); joydeep@kth.se (J.D.)

Citation: Basumatary, I.B.; Mukherjee, A.; Katiyar, V.; Kumar, S.; Dutta, J. Chitosan-Based Antimicrobial Coating for Improving Postharvest Shelf Life of Pineapple. *Coatings* **2021**, *11*, 1366. <https://doi.org/10.3390/coatings11111366>

Academic Editor:
Alexandra Muñoz-Bonilla

Received: 24 October 2021
Accepted: 2 November 2021
Published: 8 November 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

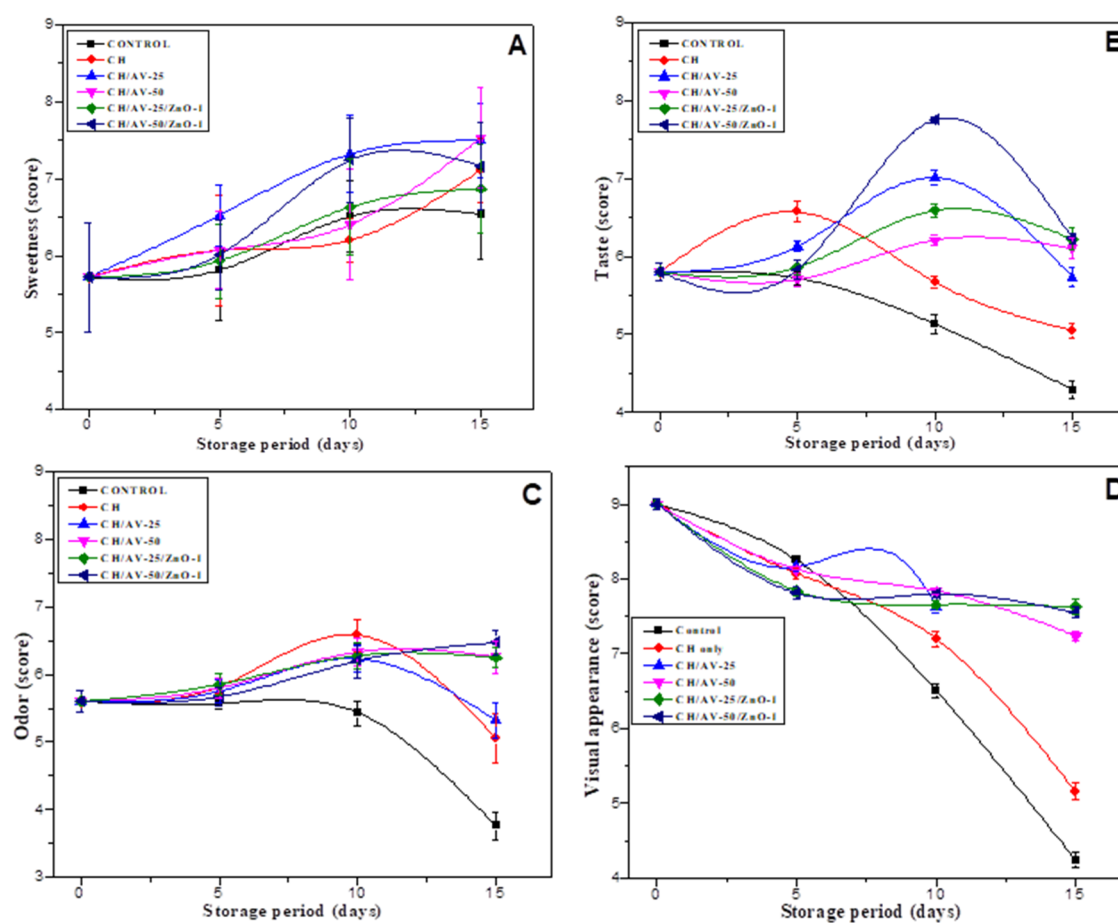


Figure S1. Effects of coating formulations on sensory attribute scores; (A) sweetness, (B) taste, (C) odor, and (D) visual appearance of the treated and untreated pineapple fruit during 15-days storage at ambient condition.

Table S1. Values of weight loss, total soluble solid (TSS), titratable acidity (TA), and maturity index (TSS/TA) of the coated and uncoated pineapple fruits during storage for 15 days at ambient condition.

Parameter	Storage Period (days)	Treatments					
		Control	CH only	CH/AVG-25	CH/AVG-50	CH/AVG-25/ZnO-1	CH/AVG-50/ZnO-1
Weight loss (%)	0	0 ± 0 ^{aA}	0 ± 0 ^{aA}	0 ± 0 ^{aA}	0 ± 0 ^{aA}	0 ± 0 ^{aA}	0 ± 0 ^{aA}
	5	5.41 ± 0.32 ^{abB}	4.19 ± 0.81 ^{bb}	4.38 ± 0.82 ^{abB}	6.05 ± 1.14 ^{abB}	5.65 ± 1.11 ^{abB}	5.16 ± 0.49 ^{abB}
	10	10.63 ± 0.12 ^{aC}	10.19 ± 0.71 ^a	9.45 ± 0.69 ^{abC}	9.06 ± 0.97 ^{bC}	9.65 ± 1.07 ^{abC}	8.68 ± 1.13 ^{bC}
	15	16.60 ± 0.21 ^{aD}	14.41 ± 1.04 ^{abD}	13.23 ± 0.64 ^{bdD}	11.56 ± 0.52 ^{cD}	13.25 ± 0.34 ^{bdD}	11.4 ± 0.12 ^{cD}
TSS (%)	0	11.51 ± 0.27 ^{aA}	11.51 ± 0.18 ^{aA}	11.51 ± 0.14 ^{aA}	11.51 ± 0.17 ^{aA}	11.51 ± 0.11 ^{aA}	11.51 ± 0.08 ^{aA}
	5	13.52 ± 0.16 ^{aB}	15.01 ± 0.12 ^{bb}	13.82 ± 0.11 ^{aB}	12.53 ± 0.13 ^{bB}	12.52 ± 0.17 ^{bB}	12.5 ± 0.12 ^{bB}
	10	13.44 ± 0.12 ^{bcB}	14.72 ± 0.13 ^{aB}	13.22 ± 0.11 ^{bcB}	12.73 ± 0.11 ^{bB}	13.11 ± 0.12 ^{bcB}	12.86 ± 0.12 ^{bcB}
	15	14.47 ± 0.82 ^{aB}	13.62 ± 0.11 ^{aB}	12.22 ± 0.09 ^{cC}	12.71 ± 0.11 ^{bcB}	11.83 ± 0.12 ^{cC}	11.52 ± 0.12 ^{cC}
TA (%)	0	0.71 ± 0.04 ^{aA}	0.71 ± 0.04 ^{aA}	0.71 ± 0.03 ^{aA}	0.71 ± 0.03 ^{aA}	0.71 ± 0.02 ^{aA}	0.71 ± 0.04 ^{aA}
	5	0.66 ± 0.02 ^{aAB}	0.66 ± 0.04 ^{aAB}	0.67 ± 0.02 ^{aAB}	0.69 ± 0.04 ^{aAB}	0.68 ± 0.03 ^{aAB}	0.69 ± 0.03 ^{aAB}
	10	0.63 ± 0.04 ^{aAB}	0.64 ± 0.02 ^{aAB}	0.64 ± 0.03 ^{aAB}	0.66 ± 0.02 ^{aAB}	0.65 ± 0.03 ^{aAB}	0.65 ± 0.03 ^{aAB}
	15	0.59 ± 0.02 ^{aB}	0.61 ± 0.03 ^{aB}	0.62 ± 0.04 ^{aB}	0.64 ± 0.03 ^{aB}	0.64 ± 0.04 ^{aB}	0.64 ± 0.04 ^{aB}
TSS/TA	0	16.21 ± 0.64 ^{aA}	16.21 ± 0.55 ^{aA}	16.21 ± 0.93 ^{aA}	16.21 ± 0.49 ^{aA}	16.21 ± 0.57 ^{aA}	16.21 ± 0.07 ^{aA}
	5	20.48 ± 0.92 ^{abB}	22.74 ± 0.71 ^{aB}	20.62 ± 0.85 ^{abB}	18.15 ± 0.14 ^{baB}	18.41 ± 0.93 ^{baB}	18.11 ± 0.41 ^{bb}
	10	21.33 ± 0.71 ^{abBC}	23.12 ± 0.66 ^{aB}	20.65 ± 0.12 ^{bb}	19.29 ± 0.75 ^{bb}	20.17 ± 0.43 ^{bb}	19.78 ± 0.83 ^{bb}
	15	24.52 ± 0.45 ^{aC}	22.71 ± 0.72 ^{abB}	19.71 ± 0.87 ^{bb}	19.86 ± 0.86 ^{bb}	18.48 ± 0.73 ^{baB}	18.01 ± 0.11 ^{bb}

The values are expressed as means ± SD of triplicate assays, and the lower case and upper case letters in superscript with the values indicate they are significantly different by LSD at P < 0.05 between treatments in columns and storage time in rows, respectively.