Evaluation of chitosan based coatings with microencapsulated *Lactobacillus plantarum* for the postharvest quality preservation of litchi and rambutan.

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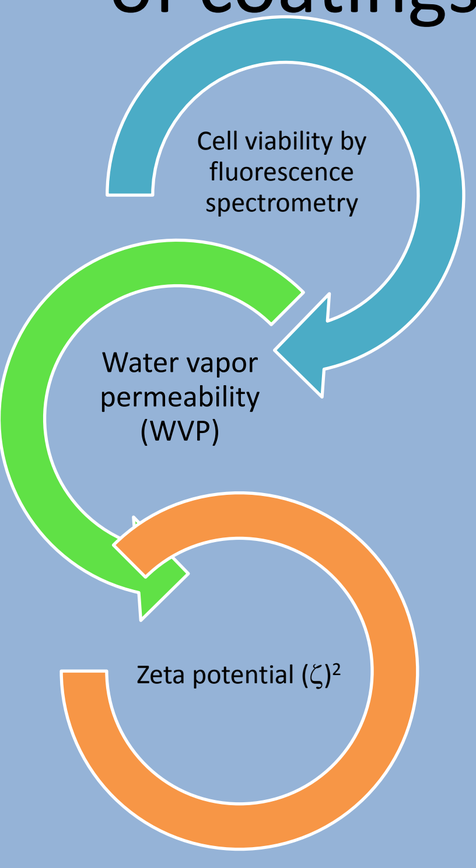
ABSTRACT

- Litchi and rambutan are subtropical fruits which principal problem is the desiccation, resulting in browning of the pericarp.
- In order to address this issue, the application of coatings made with biopolymers, arises as a new technology in postharvest preservation.[1]
- This paper proposes the microencapsulation of *Lactobacillus plantarum* (LAB) with chitosan (Q), pectin (P) and β-lactoglobulin (β), which allowed the viability of LAB in a polyelectrolyte complex QPβBAL.
- The QβPBAL coating was applied onto the fruits with improved results compared to control (untreated fruits), thus prolonging the postharvest quality of litchi for 14 days and for 20 days in rambutan.

METHODS

Characterization of coatings



Application of coatings

Experimental units (UE) were 370 g of fruit, previously selected and placed in clamshell packaging [3]

- The UE were stored at 10 ° C and 75% RH

Litchi and rambutan

- Extraction of anthocyanins and determination by HPLC [4]
- Analysis of color changes: L *, a *, b * h.
- Scanning electron microscopy (SEM)

RESULTS

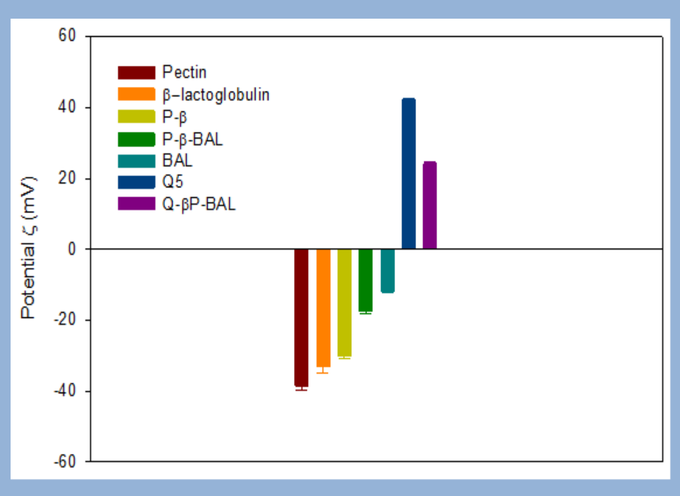


Fig. 1 ζ Potential of coatings

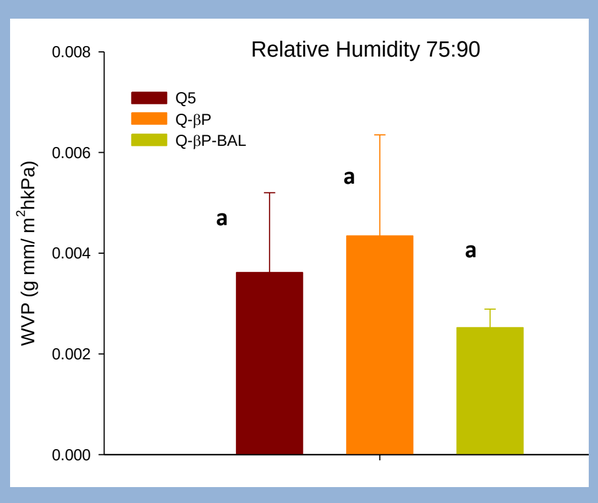


Fig. 2 WVP of coatings

Table 1. Viability of BAL in coating Q-βP-BAL at fruit storage conditions of 75% RH and 10°C

Time (d)	0	7	14	21
Viability (%)	89.91±0.12	73.24±0.07	58.01±0.17	14.63±0.04

Litchi

Fig. 3 Visual Quality litchi treated with Q-βP-BAL and control. 0,7 and 14 days of storage at 10 ° C and 75% RH

Fig. 4 Change of pericarp color of litchi

Fig. 5 SEM micrographs of litchi pericarp: control (a), Q-βP-BAL litchi 0 d (b, c); 14 d (d).

Rambutan

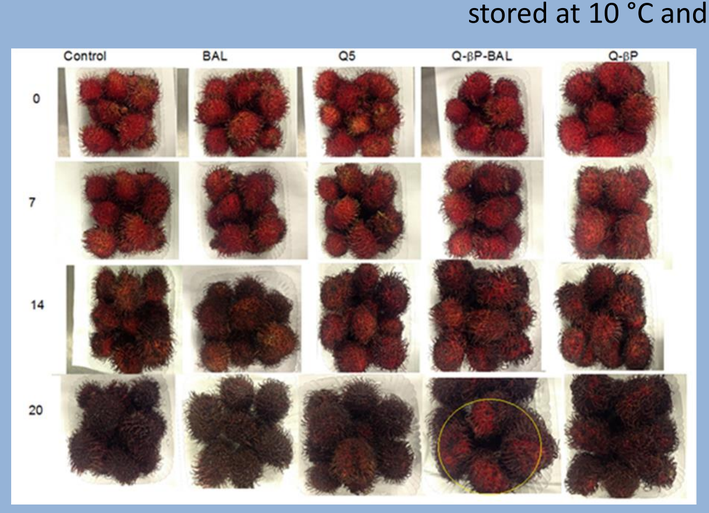


Fig. 7 Visual quality of rambutan treated with BAL, Q (5g/L), Q-βP and Q-βP-BAL. 0, 7,14 and 20 d of storage at 10 °C and RH 75%

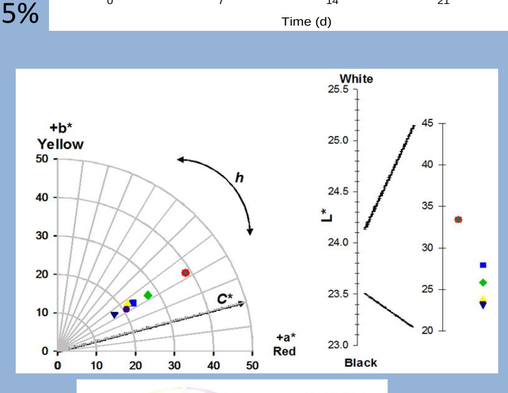


Fig. 8 Change of pericarp color of rambutan

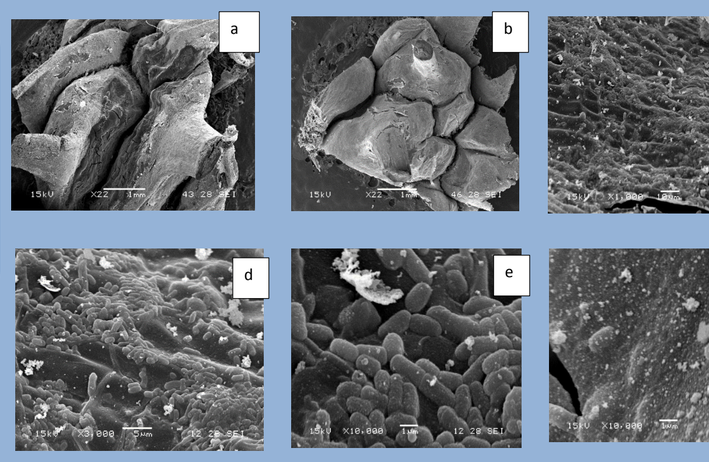


Fig. 9 SEM micrographs of rambutan pericarp: a) Q5, b) Q-βP; c, d and e) Q-βP-BAL at t=0d; f) Q- β P-BAL at t=20d.

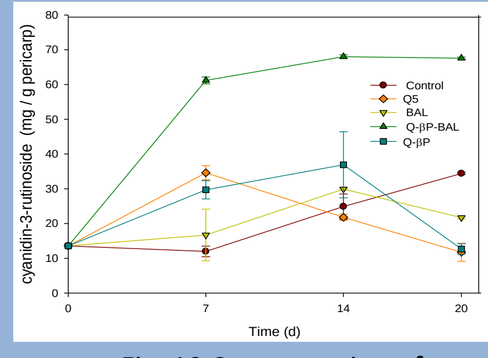


Fig. 10 Concentration of cyanidin-3-rutinoside determined pericarps of rambutan stored at 10 ° C and RH 75%

Fig. 6 Concentration of cyanidin-3-rutinoside determined litchi pericarp stored at 10 °C and RH 75%

CONCLUSIONS

The Q-βP-BAL coating maintained quality characteristics of litchi and rambutan, thus prolonging the postharvest quality for former 14 days and for latter 20 days. This was attributed to the BAL stabilizing effect on anthocyanins present in the pericarp of these fruits.

Acknowledgements

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