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Effects of Apple Pomace Addition Level on the Microstructure and Physical Properties of Corn-Based Extrudates

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Abstract

Apple pomace (AP), a by-product of apple processing, is a promising ingredient for value-added extruded products. This study evaluated the effects of AP addition (2.5–7.5%) on the microstructure and physical properties of corn-based extrudates. Increasing AP levels reduced the sectional expansion index (SEI) from 13.02 ± 0.08 to 10.10 ± 0.03 and lightness (L^*) from 81.43 ± 0.23 to 70.87 ± 0.32, while increasing the water absorption index (WAI) from 4.86 ± 0.02 to 5.68 ± 0.05 and swelling index (SI) from 2.61 ± 0.08 to 3.62 ± 0.06. SEM analysis revealed microstructural changes, particularly at 7.5% AP.

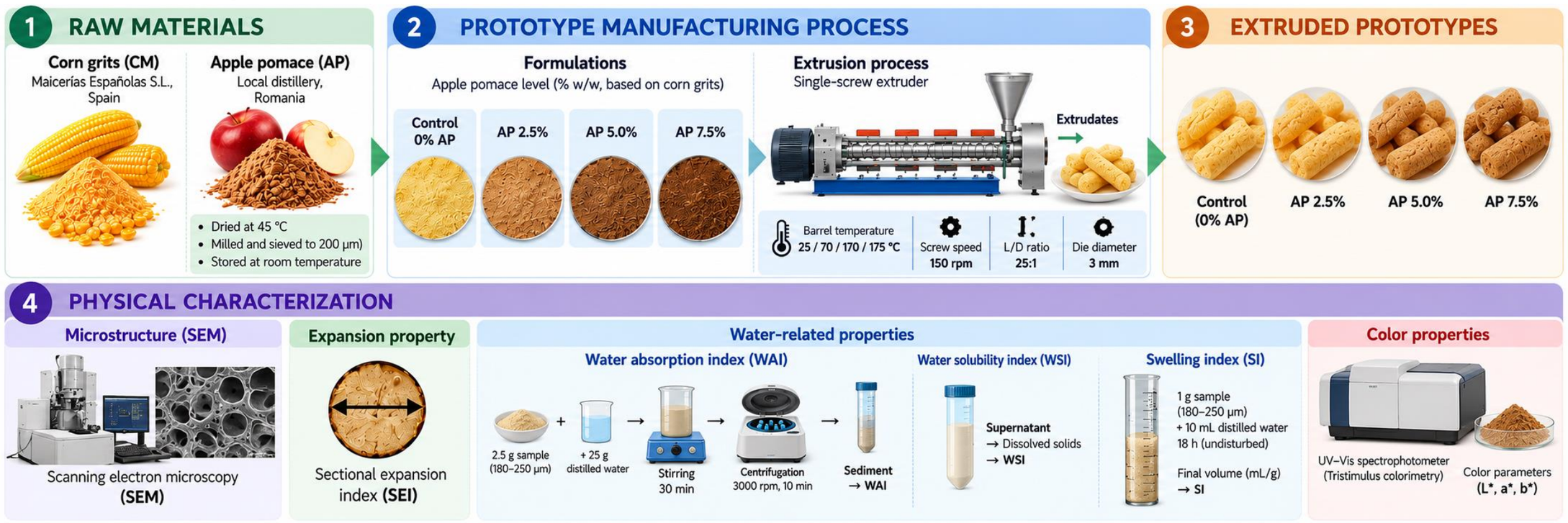
Aim

To evaluate the effect of apple pomace addition level (2.5%, 5.0%, and 7.5%) on the microstructure, expansion, hydration properties, and color of corn-based extrudates.

Introduction

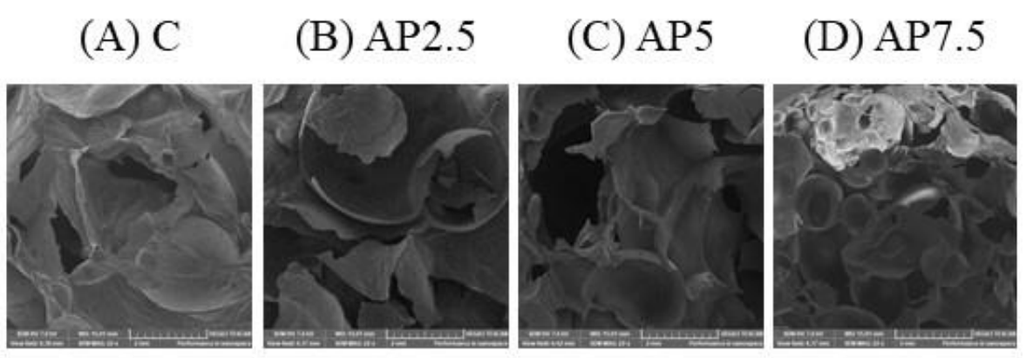
Apple pomace, a by-product of apple processing, is a source of dietary fibre and bioactive compounds with potential applications in food development. Its incorporation into corn-based extrudates may influence their microstructure and physical properties.

Material and method

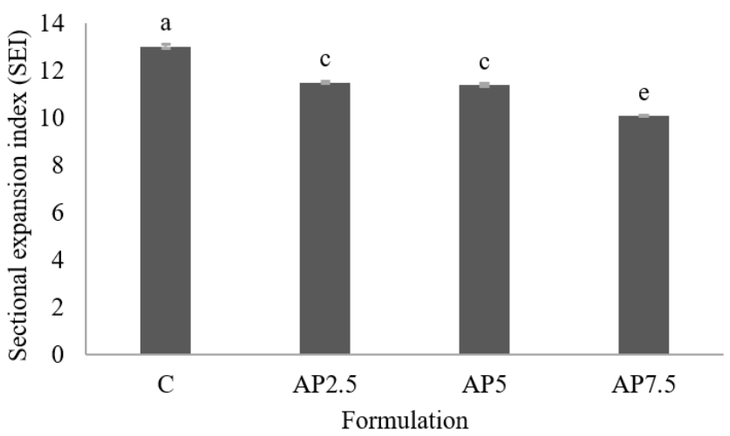


Results and discussions

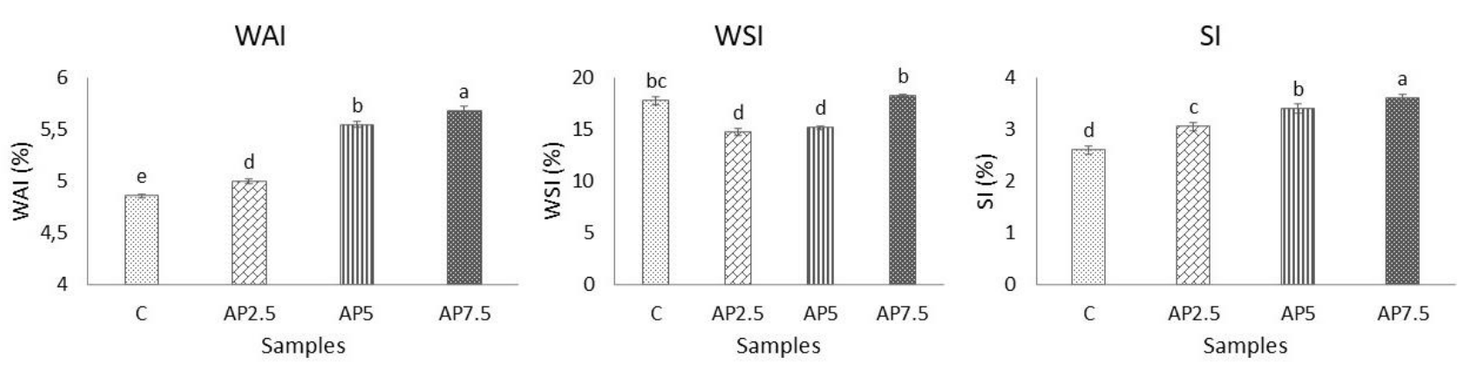
1. Scanning Electron Microscopy (SEM)



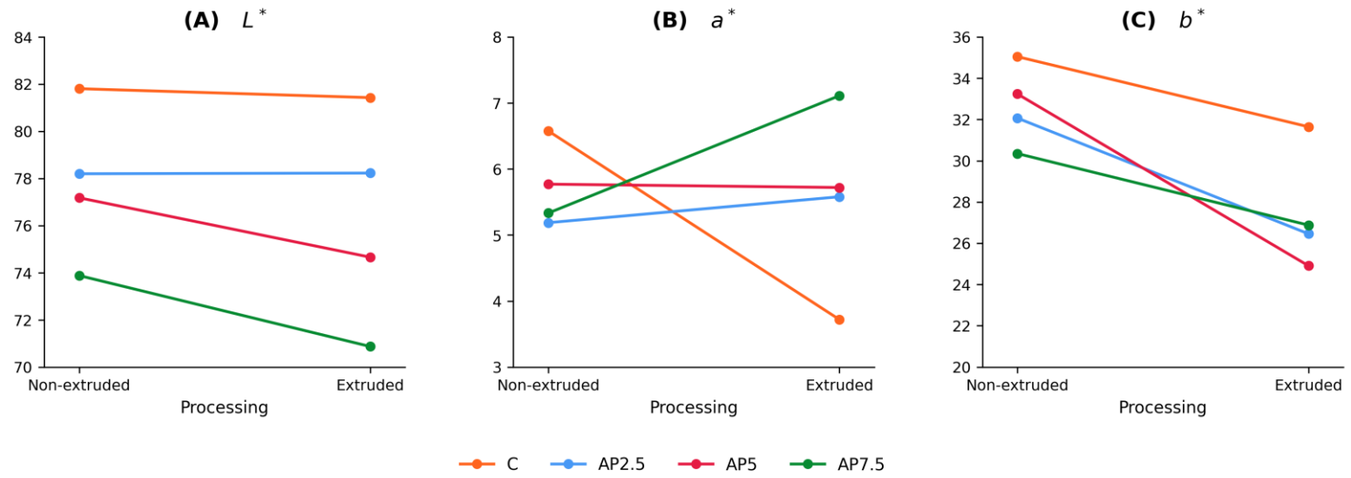
2. Sectional expansion index (SEI)



3. Water-related properties



4. Color properties



Conclusions

- Apple pomace incorporation altered the microstructure of corn-based extrudates, particularly at 7.5%
- Increasing apple pomace levels reduced SEI, increased WAI and SI, while WSI exhibited a non-linear response.
- Apple pomace addition progressively decreased lightness (L^*) and generally increased redness (a^*).

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