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Influence of drying temperature on drying behavior and quality of mango kernels

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Problem and Objective

- Mango (*Mangifera indica L.)* is one of the most important tropical fruits.
- One of the main by-products of mango production are the kernels. To utilize the mango kernels, drying is an important step for later applications.
- The main objective of this study was to investigate the effect of different drying temperatures on drying behavior and some quality parameters of mango kernels.

Material and Methods

- The mango fruits cv. Kent imported from Brazil were purchased at a local market in Stuttgart.
- The drying experiment was conducted at temperatures of 40, 50 and 60 ° C using a high precision laboratory dryer (Fig.1).
- Air velocity and absolute humidity of the air were held constant at 0.2 m s^{-1} and 10 g kg^{-1}, respectively.

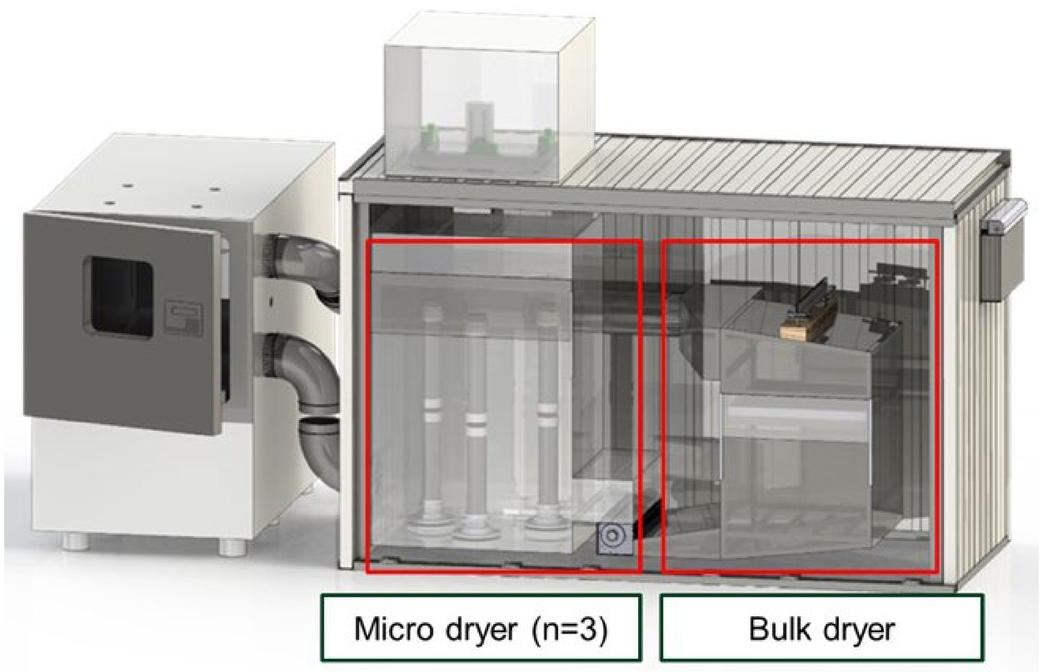

Fig. 1 The high precision laboratory dryer.

- Mass loss from the mango kernels was recorded at intervals of 5 min.
- Furthermore, the quality of dried mango kernels was determined in terms of color, total phenolic content, flavonoids and total tannin content.

Results

- The results showed that the moisture content decreased gradually until the desired moisture content of 9 % was accomplished (Fig. 2).

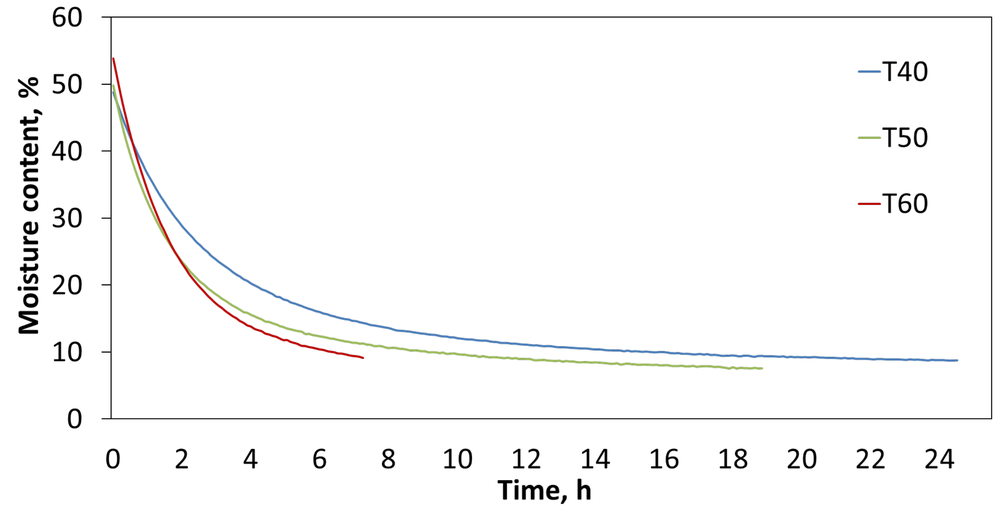

Fig 2. The drying curve of mango kernels at different temperatures.

- With an increase in the temperature, the total drying time decreased remarkably.
- Color of the mango kernels was substantially influenced by drying. Although, there were no significant differences in color parameters (L*a*b*) among mango kernels dried at different temperatures.
- The mango kernels dried at 60° C showed the highest total phenolic content (83.4 ± 2.9 GAE mg·g^{-1} of the dried sample), flavonoids (63.3 ± 1.5 mg·g^{-1} of the dried sample), and tannin content (77.3 ± 1.5 mg·g^{-1} of the dried sample) compared to those dried at the other temperatures ($p < 0.05$).

Conclusions

- It was observed that the choice of the drying temperature could change the ingredients of the mango kernels.
- In addition, a drying temperature of 60° C was found to be the optimal operating temperature for mango kernels regarding their quality and drying time.

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