

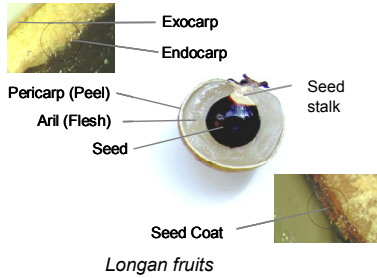


Single-layer drying behaviour of longan (*Dimocarpus longan* Lour.)

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Introduction

- During 2003-2004, 40% of exported longan from Thailand were dried longan



- In industry, whole longan fruits are dried in deep-bed dryers
- Current information about drying behaviour of single fruit is marginal

Materials and Methods

- fresh longans were attained from Asian shop in Germany (lot no.1-3) and fresh market in Thailand (lot no. 4)

Lot No.	Moisture Content, %w.b.			Water Activity		
	Pericarp	Aril	Seed	Pericarp	Aril	Seed
1	22.8	79.6	39.6	0.867	0.979	0.975
2	24.4	77.1	38.6	0.900	0.973	0.966
3	34.8	79.7	37.6	0.906	0.982	0.973
4	44.4	79.4	37.6	0.986	0.985	0.974

- Longan was classified in three sizes and dried with varying velocity, temperature and relative humidity of drying air

Results and discussions

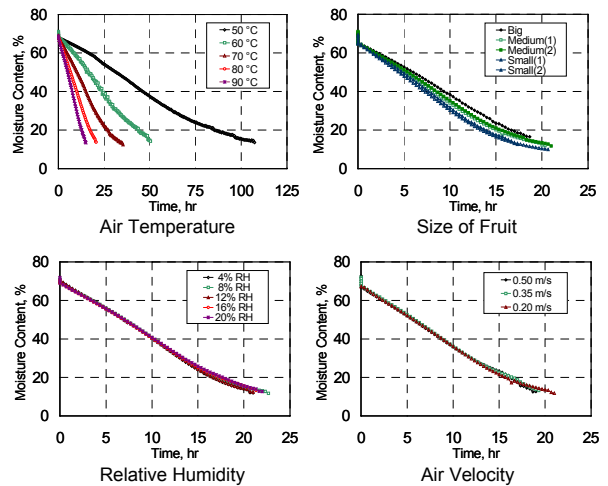
- Quality of dried products

Exp.	Moisture Content, %w.b.			Water Activity		
	Pericarp	Aril	Seed	Pericarp	Aril	Seed
T = 50°C	8.0	15.6	14.6	0.458	0.587	0.751
60°C	8.3	17.7	13.1	0.447	0.599	0.700
70°C	6.5	14.7	13.5	0.398	0.581	0.737
80°C	7.0	16.7	14.5	0.476	0.616	0.815
90°C	6.4	16.4	14.4	0.437	0.614	0.796
v=0.20m/s	6.0	13.5	13.9	0.375	0.576	0.753
0.35m/s	5.3	13.4	13.0	0.387	0.546	0.750
0.50m/s	6.4	14.5	13.8	0.416	0.584	0.757
RH=4%	6.0	13.2	14.8	0.379	0.567	0.815
8% **	5.7	14.1	12.9	0.397	0.551	0.776
12%	6.5	14.1	14.6	0.380	0.565	0.829
16%	6.3	16.6	13.3	0.415	0.579	0.799
20%	6.3	14.8	14.1	0.424	0.570	0.787
Big	6.6	16.5	15.6	0.445	0.610	0.841
Medium ⁽²⁾	6.2	15.0	15.4	0.375	0.566	0.810
Small ⁽¹⁾	5.0	12.0	11.0	0.297	0.496	0.712
Small ⁽²⁾	5.9	14.9	14.8	0.361	0.549	0.821

** Medium⁽¹⁾

- Moisture content of seed still high and higher than that of aril
- Seed mainly shows water migration through seed stalk
- Water activity of seed and aril are different at the same moisture content means due to the difference in composition and structure

Drying Kinetics



- Drying kinetics was strongly influenced by the air temperature and size of fruit but not effected by velocity and relative humidity of drying air

Conclusion

- The drying kinetics of whole longan fruits at 80° C depends on size of fruit and temperature of the air
- Diffusion of water inside the fruit is more influencing than convective transfer outside the fruit by drying air
- Understanding of physiology of fruit, drying behavior and sorption kinetics of each part in longan, modeling of drying of whole longan fruits was possible

Reference

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Acknowledgements

Grateful to Thai Airways International and Royal Chittadra Projects for sponsoring transportation of longan to Germany

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