

UNIVERSITI TEKNOLOGI MARA

**GERMINATION AND
DESICCATION TOLERANCE OF
Canarium odontophyllum SEEDS**

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ABSTRACT

Canarium odontophyllum is a rare fruit species primarily known for its edible fruits and kernel with many valuable active compounds for humans. However, the fruit availability is seasonal and this affects not only the continuous supply of seeds as planting materials but also the conservation programmes in attempts to commercialize this fruit species. Past studies on its seeds were very limited with low and inconsistent germination records. Success with vegetative propagation means of this fruit species, on the other hand, was even much lower. Detail and systematic studies on the seeds were, hence, planned for the current research work for better handling of the seeds for planting and conservation purposes. Such studies are crucial for large scale fruit production programmes in view of its growing importance for food industry, medicinal purpose, as well as cosmetic industry. The first study of the current research work was aimed to determine the possibility of seed dormancy caused by the hard and thick endocarp enclosing the seed. In this study, the morphological and physiological characteristics of fruits and seeds of *C. odontophyllum* of different ripeness, i.e. full size unripe, half ripe and fully ripe, were recorded to be related to seed germinability. Subsequent study was planned to determine the seed germination as affected by desiccation as an important postharvest handling procedure. In this research work, fruits were collected from trees located in Selangau District and Padawan District, Sarawak from 2013 to 2016 for experimentations. The differences in fruit length, fruit diameter and endocarp thickness between unripe and half ripe fruits were not significant, but increment in these parameters in the fully ripe fruits was significant indicating that the fully ripe fruits were significantly the biggest with the highest fresh weight throughout fruit development and ripening. Fully ripe fruits, however, had the thinnest mesocarp layer. Seed within the fruit, on the other hand, gained full length by full size unripe stage and only increased in diameter as the fruit changed from full size unripe to fully ripe stage. In contrast, moisture content (MC) of mesocarp and seed decreased significantly in ripening fruits. When fruit ripeness was related to seed germinability, seeds extracted from all ripeness as studied showed above 80% germination. The seeds from different fruit ripeness, however, differed in speed of germination expressed as germination index; seeds from fully ripe fruits started germination at four days after sowing while those from full size unripe and half ripe fruits germinated only at two weeks after sowing following warm and moist incubation in the moist sand at room temperature. In the subsequent trial on desiccation tolerance of the seeds, *C. odontophyllum* seed could be considered as recalcitrant seed. Although the seeds could tolerate rapid desiccation using drying beads (DBs) down to MC of less than 10% while retaining 90% germination, fruit freshness was found to greatly affect seed viability. Fruits deteriorated fast within a few days after harvest and lowered viability of seeds within them even with no desiccation treatment. For seeds extracted from fresh fruits with high viability, rapid desiccation with DBs caused fine cracks on endocarp, making these seeds susceptible to microbial infestation when stored with conventional seed storage approach. Slower seed desiccation using convection oven at 40 °C, on the other hand, could not retain seed viability when the seeds were dried to MC below 15%. Storage of the seeds is, hence, almost impossible.

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