SEX TYPING IN *Canarium odotophyllum* MIQ. (DABAI) USING MOLECULAR MARKERS

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ABSTRACT: Dabai (*Canarium odontophyllum*) being a Sarawak's specialty fruit is well-known with its unique sexual characteristic. The hermaphrodite dabai trees bear fruits while male dabai trees do not and are normally removed 4 years later when the plants are reproductively mature. This lengthy life cycle along with inability to determine gender at early stage can result in undesirable waste of time, space, resources and nursery cost. The main objective of this study is to identify diagnostic bands related to sex determination in *C. odontophyllum* using random molecular markers, followed by conversion into sex-specific SCAR marker. A total of 64 RAPD primers were amplified via Bulk Segregant Analysis (BSA) approach and 24 RAPD primers were found to have amplified sex diagnostic bands, with a total of 20 hermaphrodite-specific and 18 male-specific diagnostic bands. In order to confirm their specificity, these diagnostic bands were re-amplified on individual sample. To date, one hermaphrodite-specific diagnostic band (DH_{272}) was converted into SCAR marker. 2 SCAR primer pairs were generated on different approaches and subjected to confirmation test by amplifying both primers on individual samples. The test result found that both primers tend to amplify monomorphic products and loss their initial polymorphism. In the future, several approaches can be applied to recover the polymorphism so that the developed SCAR marker can be used in future validation test.

Keywords: Dabai, sex typing, Bulk Segregant Analysis (BSA), RAPD primers, SCAR markers

INTRODUCTION

Dabai, named botanically as *Canarium odontophyllum* is an exotic and nutritious fruit among the local population in Sarawak (Morico *et al.*, 1998). This indigenous fruit of Sarawak is commonly known as "Sibu Olive" and is found along the riverbanks in Sibu, Kapit and Sarikei divisions (Jackson, 2008). Belonging to the family of Burseracea, it is reported that the species is dioecious with male and hermaphrodite flowers borne on different trees. This annual plant has its fruiting season set towards the year-end, together with durian season (Jackson, 2008). The dabai trees may grow to an altitude up to 700 metres above sea level. They are heavy fruit bearer and may yield up to 800 kilograms per tree (Gregory, 2007). The dabai fruits are white in colour during their immature stage and subsequently turn purple when ripen. The olive-like fruits are oblong in shape, 35 to 40 mm long, 20 to 25 mm wide, and have a thin edible skin. The whitish or yellow edible mesocarp inside is 6 to 8 mm thick and covers a single, large three angled seed (Whitmore, 1972).

According to Voon & Kueh (1999), *C. odontophyllum* is a very nutritious fruit with high value of energy, protein and potassium. Recent study by Universiti Putra Malaysia (UPM) also reported the potential of dabai fruits to be exploited as functional food due to its high antioxidant properties (Jackson, 2008). Considering its beneficial properties, the Sarawak Agriculture Department is confident to venture into commercialization of dabai as Sarawak specialty fruit. Research and development (R&D) conducted by the department so far includes the use of