

Emergence of multiple seedlings from seed of *Garcinia mangostana* L. (Clusiaceae).

ABSTRACT

Polyembryony is the formation of multiple embryos in a single seed. It was reported to occur in *Garcinia mangostana* through sporophytic adventitious embryony. This paper reports new insight of multiple shoot formation on seed of *G. mangostana* and a different finding compare to previous studies. A germination study was carried out during the July to August mangosteen fruiting season at University Agriculture Park, Universiti Putra Malaysia. Ten trees were randomly selected and 20 fruits samples were collected. From each fruit, only the biggest seed was used. Seed was disinfected using benomyl and sown on sterilized sand. Flower buds and flowers were also collected. Histological studies were carried out following the TBA series and dyed with Fast Green and Safranin O. For scanning electron microscopy (SEM) observations, samples were fixed in 70% formalin acetic acid and dehydrated using critical point dryer. Samples were mounted on aluminum stubs and finally coated twice with gold for two minutes. The percentage of seed germination was 47% and from that 11% of seeds were with multiple shoots. The morphology of the mangosteen seed was made of hypocotyl with two long strips of vascular bundle. From the histology and SEM, it was shown that shoot and root arises from the end of the vascular bundle. It was also observed that in some instance there were two ovules per locule that further developed into hypocotyls. The hypocotyls carrying their own vascular bundles will unite and enclosed by a single testa and form the "seed". From each hypocotyl single shoot will emerged. When there are two to three hypocotyls united, two to three shoot will emerged thus displaying multiple shoots per seed. This study concluded that the term polyembryony is not suitable because there was only a single embryo per hypocotyl.

Keyword: Hypocotyl; Polyembryony; Somatic embryo; Mangosteen; Multiple seedlings.