

Germination and seedling survival in kemenyan, *styrax benzoin*

ABSTRACT

Styrax benzoin Dryand var. *benzoin* is atypical of Malaysian forest trees as its seeds are dormant for more than 7 months after fruit fall. Under natural conditions the woody endocarp cracks after 7 -9 months and the radicle and hypocotyl then emerge. Dormancy is not imposed by the presence of inhibitors, immaturity of the embryo nor special requirements of light or temperature, as after removal of the endocarp germination begins. The endocarp therefore imposes dormancy either mechanically or by preventing the entry of water. The seedling becomes dependent on its photosynthesis at the 3-leaf stage about 4 -6 months after germination, when the reserves from the seed in the form of starch in the hypocotyl are exhausted. Seedling mortality is high with 22.5% survival after 1 year, 7.1% after 2 years and none after 3 years. The largest single cause of mortality is mechanical damage (34%) which includes death caused by falling trunks and branches, by being covered by leaf litter or from trampling; followed by mortality during the germination phase (27%) such as the hypocotyl being gnawed, failure of the endosperm to be cast off or failure to root; fungal wilt (24%) and failure to sustain growth (15%). No seedling died as a direct result of insect damage. Difficulties in assessing insect damage are discussed. 19% of seedlings had spiders' nests under their leaves which resulted in a 2 -43% reduction of photosynthetic surface. A combination of annual fruiting and a proportion of seedlings that persist for more than a year ensures that at any time there is a supply of seedlings ready to grow into a gap should one occur in the vicinity.

Keyword: *Styrax benzoin*; Germination; Seedling; Malaysian trees