Calophyllum inophyllum: an apomict or a true seed?

Reproduction is a fundamental process of life. Embryo in angiosperms is formed by either amphimixis or apomixis. In amphimixis, embryo and endosperm are produced as a result of double fertilization, whereas in apomixis there is complete absence of fusion of gametes. Apomixis is a natural way of cloning plants through seeds. Determining the fate of the seed is one of the most important steps in developing conservation strategies by the gene bank managers. Embryological data on apomixis are scanty and its significance increases many folds when the seed is endemic and endangered. *Calophyllum inophyllum* is a multipurpose tree belonging to the family Clusiaceae, commonly known as mangosteen family, where most of the members like *Garcinia* exhibit apomixis. This plant has multiple origins including the Indian coastal region and has been recognized as an anti-HIV drug source. *Calophyllum* is a low-branching and slow-growing tree with two distinct flowering periods of late spring and late autumn. Seeds for the present study were extracted from fruits picked directly from the trees of coastal areas of Kunkeshwar, Maharashtra. The fruit is a drupe having single seed (Figure 1). It is endangered due to the presence of a hard coat on the seed which inhibits germination and also due to high predation by terrestrial crab, *Cardisoma carnifex* (Herbst) (family Geocarcinidae)[1]. This tree offers excellent scope for study because of its large-sized traceable seeds.

Figure 1. *Calophyllum inophyllum* fruit.

Perusal of the literature suggests the common hypothesis regarding *Calophyllum* being an apomict. The present study was undertaken to confirm the embryonic status of the seed. It was seen that the seeds are true seeds with an embryo positioned at the apex. This was confirmed by tetrazolium test. The moisture content of the fresh seeds was 28%, estimated at 103°C for 17 h (ISTA rules[2]). The seeds were kept for germination studies between papers. Emergence of radicle was considered as germination (Figure 2). Under nursery conditions the seeds are reported to germinate in about 18 days; whereas in lab conditions it took about 60–70 days for emergence of radicle and plumule (Figure 3).

Figure 2. Emergence of radicle.

Figure 3. Emergence of radicle and plumule

It was observed that seeds stored at ambient temperature lost their viability completely within a fortnight, whereas the seeds kept wrapped in moist paper towels in plastic boxes at 4–10°C remained viable up to four months. This indicates that the seeds are not orthodox but are intermediate in their seed storage behaviour. Further studies are underway to validate our findings on seed storage behaviour.

1. Lauren D. Zerbib, *Biology and Geomorphology of Tropical Islands*, 2007.
2. International Seed Testing Association, 2003.

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