

Short Communication

Variation in Seed and Seedling Characteristics of *Acacia mangium*

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Acacia mangium Willd. is a species belonging to the family Leguminosae, subfamily Mimosoideae. Its important attributes include rapid growth, wood quality (for pulp, sawn timber and fuel) and tolerance of a range of soil types. Its native to Queensland, Australia, Molucca islands, Indonesia and South West of New Guinea. In India, Mangium was introduced in the eighties and farmers started planting Mangium in farm fields in the early 1990s, particularly in Kerala state [1].

The present study was conducted to observe variations in seed and seedling traits of *Acacia mangium* in relation to different seed sources and soil media used to conduct germination studies.

The seeds were collected from five candidate trees identified for seed collection from plantations in three different locations in Tamil Nadu. The observation on 100 seed weight revealed greater variation among five seed sources. In the present study, the mean 100 seed weight ranged from 0.92 to 1.57 g (Table 1). Similarly, it is also reported that 100 seed weight between 0.818 and 1.384 g as variation among different seed sources [2].

The dormancy of Mangium seeds is caused by the hard and water impermeable seed coat [3]. Hence, the pretreatment in the present study was given by soaking seeds in hot water at 100 °C for 30 seconds followed by cold water soaking for overnight [4]. The results have been confirmed in the present study, wherein, the hot water soaking time was increased to 60 seconds and compared

Table 1. Mean 100 seeds weight of Mangium collected from five tree in three different locations

	Tree 1	Tree 2	Tree 3	Tree 4	Tree 5
Mean 100 seed weight (g)	1.40	1.42	1.22	1.57	0.92
Standard error	0.03	0.02	0.04	0.03	0.02
Standard deviation	0.05	0.03	0.07	0.06	0.03
Minimum	1.35	1.40	1.15	1.50	0.89
Maximum	1.45	1.45	1.29	1.60	0.95
CV (%)	3.57	2.04	5.74	3.69	3.31

with 30 seconds soaking in hot water. The result showed that there was a delay in the initiation of germination as well as reduction in germination percentage when the seeds were soaked in hot water for 60 seconds (Fig. 1).

It is evident from Fig. 2 that the variations in germination of Mangium seeds could be observed even after imparting of prescribed pre-treatments, while the overall mean germination percentage was 74.4 ± 2.5 . The germination percentage varied from 55 to 88 per cent. Possibly such variation are mainly attributed to tree source and potting media characteristics (Fig. 2). Among different potting media, the forest top soil (without admixture of any manure) was observed to register quicker as well as higher germination percentage (60-85%),

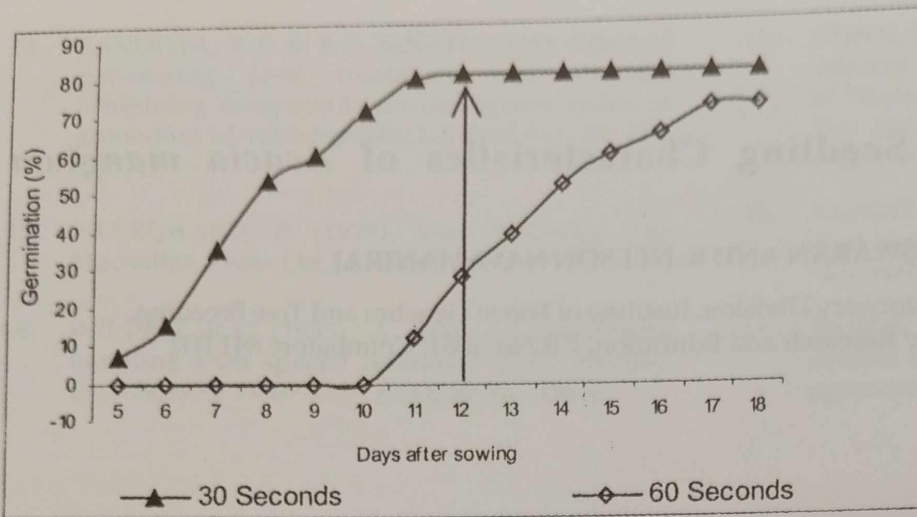


Fig. 1. Effect of duration of hot water soaking on germination of Mangium seeds

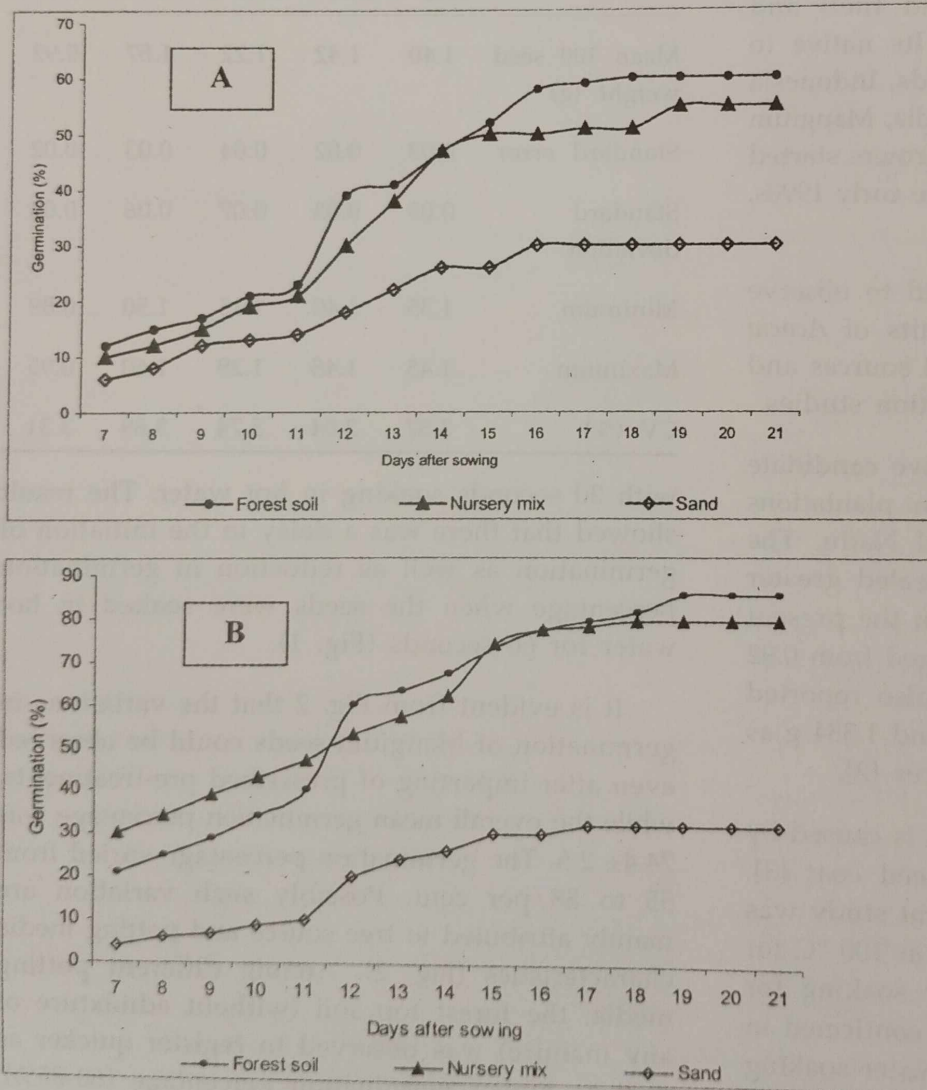


Fig. 2. Effect of potting media on germination of Mangium seeds collected from plantations in Devathanapatty, (A) and Kottur, (B) in Tamil Nadu

when compared to nursery mix having 2:1:1 ratio of Red soil:sand:FYM (55-79%) and sand media (30-32%). Further, it could be observed that the seeds collected from plantation in Kottur, near Theni recorded higher germination percentage (85%) than the seeds from Devathanapatty, near Periyakulam (60%) even in the same potting media with forest top soil. Hence, it is concluded that the use of good seed source and fertile substrata are better for obtaining higher germination of seeds.

The most common nursery substrate is topsoil with sandy loam texture. Even when using topsoil, for uniform growth of Mangium, fertile soils should be collected, rather than haphazard collection from different locations [5]. Other workers also reported that Mangium is very sensitive to the potting media and due to poor substrata the most common problem of "Yellowing" of seedlings could be noticed [6]. In the present study survival and growth rate of Mangium seedlings varied in different potting media. In this experiment, seedlings of uniform size were transplanted into a bigger size polybags (30 x 25 cm) filled with two types of potting media viz. A) Nursery mix of Red soil:Sand:FYM in the ratio of 2:1:1 and B). Top soils from forest land without admixture of any manures. The results showed that seedlings attained greater mean shoot length (88.9 cm) as well as mean root length (27.8 cm) in the forest top soil media, when compared to seedlings raised in standard nursery mix (registering shoot length of 50.2 cm and root length of 11.2 cm). Further,

seedlings in the nursery mix started showing "Yellowing" of leaf and produced multiple branching (Fig. 3).

To conclude, it is important not only to identify and use good seed source but also equally important to use good and fertile substrata for higher germination as well as better seedling growth, particularly with reference to exacting species like *Acacia mangium*.

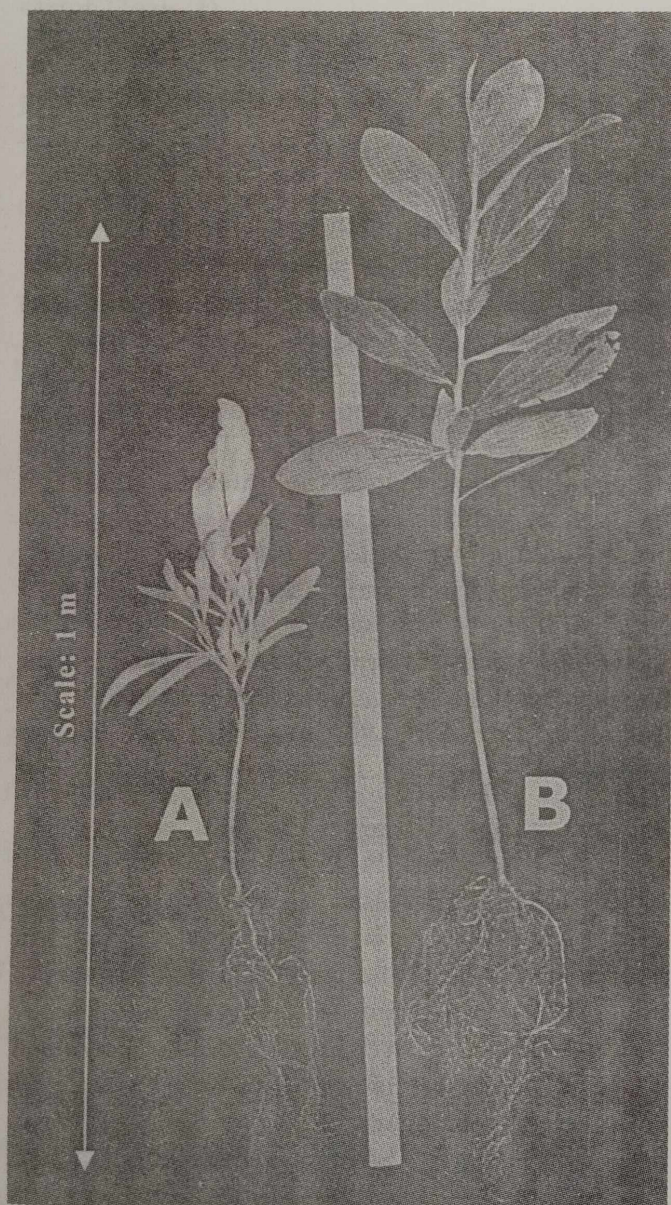


Fig. 3. Variation in growth pattern of Mangium seedlings raised in nursery mix using of 2:1:1 ratio of Red soil:Sand:FYM (A) and in forest topsoil (B)

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