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RESEARCH ARTICLE

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Pod and seed trait variation studies in provenances of *Pongamia pinnata* (L.) Pierre. A potential agroforestry tree

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ABSTRACT

Screening of 40 candidate plus trees from naturally available *Pongamia pinnata* genetic resources was carried out to elucidate the variation of pod and seed traits on germination capacity to select the best planting material for higher productivity. The experiment was conducted at Regional Agricultural Research Station, Bijapur, Karnataka during 2005-2006. Variability studies revealed that, among the pod trait variability studies, highest 100 pod weight was recorded in CPT-20 (661.62 g), highest pod length in CPT-17 (7.0 cm) and more pod width in CPT-17 (3.1 cm). Among the seed traits, highest 100 seed weight was in CPT-18 (279.51 g), per cent seed oil content was highest in CPT-20 (42.79%), maximum seed nitrogen in CPT-10 (6.16%), seed phosphorus in CPT-30 (1.30%), highest seed potassium content in CPT-38 (1.33%) and among the seed sources highest seed germination was observed in CPT-11 (91%). In conclusion, the results revealed the existence of substantial genetic variation, which can be utilized for genetic resource conservation in gene bank and further tree improvement programmes of the species.

KEY WORDS : Pongamia, Seed source, Pod, Trait, CPTs

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INTRODUCTION

Pongamia pinnata (L.) Pierre, an arboreal legume, commonly known as Indian-beech. This medium-size tree is indigenous to the Indian subcontinent and south-east Asia (Malaysia and Indonesia), and has been successfully introduced to humid tropical regions of the world as well as parts of Australia, New Zealand, China and USA. It is drought resistant, nitrogen-fixing leguminous tree known to withstand water logging and mild frost, with high tolerance to salinity (Scott *et al.*, 2008).

P. pinnata is an excellent multipurpose tree with each and every part of the tree having specific use. Leaves are used as lactagogue fodder, especially in arid regions and also as green manure. Dried leaves are used in stored grains to repel insects. Leaves are active against Micrococcus; their juice is used for cold, cough, diarrhea, dyspepsia, flatulence, gonorrhea, and leprosy (Muthu *et al.,* 2006). Flowers are used to treat diabetes; roots for cleaning gums, teeth, ulcers and bark for bleeding piles. The wood is not durable, hence limited to cabinet making, cartwheels, posts and fuel. The ash of the wood is used in dyeing. The seed cake is used as cattle and poultry feed and biogas production. Furthermore, the waste pulp is used as an organic fertilizer (Shrinivasa, 2001). It is valued for its seeds consisting of 30-40% oil rich in triglycerides. The oil is also used as a lubricant, water paint binder, pesticide, and in soap and tanning industries. The oil is also valued as a folk medicine in enhancing the pigmentation of skin affected by leucoderma and used as a liniment to treat scabies, herpes and rheumatism.

Besides these advantages, pongamia seed oil as bio-diesel is fast emerging as a viable alternative to fossil fuel. In meeting the future demands for bio-diesel it will be important to establish extensive commercial-scale pongamia plantations. However, the progress will be hampered by several factors *viz*., shortage of elite planting material, low viability of the seeds and insufficient seed germination due to fungal damage and presence of a hard seed coat that reduces germination capability. Moreover, the constraint of plants established by vegetative propagation through stump cuttings are not deep rooted and are easily uprooted (Azam *et al.*, 2005).

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