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RESEARCH ARTICLE

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Provenance variation studies in seedling traits 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 in seedling traits to select the best planting material for higher productivity. The experiment was conducted at Regional Agricultural Research Station, Bijapur, Karnataka during 2005-2006. Among the CPTs, highest (94.33 %) germination percentage was recorded by CPT 11, plant height in CPT 20 (59.33 cm), collar diameter in CPT 32 (0.73 cm), number of leaves in CPT 20 (40.00), root length in CPT 3 and CPT 11 (41.33 cm), shoot length in CPT 23 (21.00 cm), crown spread in CPT 26 (35.33 cm), seedling dry weight in CPT 20 (6.35 g) and highest seedling vigour index(4552) was recorded by CPT 11 (Zone-3). Among the 10 agroclimatic zones of Karnataka CPTs of zone-5 was found superior in performance.

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

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INTRODUCTION

Pongamia pinnata is a medium sized semi-evergreen drought resistant nitrogen-fixing leguminous tree known to withstand water logging and mild frost, with high tolerance to salinity (Scott *et al.*, 2008). Pongamia seeds yield non edible pongamia oil, which is used for tanning and soap making and also as biodiesel. It is an excellent coppicer and is frequently pollarded for green manure. Its leaves, flower, bark, wood and oil are having medicinal properties. 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).

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).

Hence, the challenging task, as of today is to screen the naturally available *P. pinnata* genetic resources to select the best planting material for higher productivity. Seeds from proven source or plus trees form the backbone of any successful tree improvement and afforestation programme. Quality seed has been recognized as an important input in forestry and is considered essential for increasing production and also seed polymorphism has been found to play great role in seed germination, survival and seedling growth. Keeping all this in view, an effort has been made to evaluate the extent of variation in seedling traits on germination collected from Candidate Plus trees (CPTs) of various zones of Karnataka, India.

MATERIALS AND METHODS

An extensive wild germplasm exploration survey was conducted at Regional Agricultural Research Station, Bijapur, Karnataka to identify the high yielding CPTs of

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