

Source Variation in Seed and Seedling Traits of *Pongamia pinnata*

Pongamia pinnata is a medium sized semi-evergreen drought resistant tree and the 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. Quality seed has been recognized as an important input in forestry and is considered essential for increasing production and also seed polymorphism has been

Table 1. Location of seed sources under study

Seed source No.	Seed source	District	State
S 1	Challakere	Chitradurga	Karnataka
S2	Hosdurga	Chitradurga	Karnataka
S3	Tarikere	Chickamagalur	Karnataka
S4	Chikkanayakana halli	Turnkur	Karnataka
S5	Honnali	Davangere	Karnataka
S6	Harihara	Davangere	Karnataka
S7	Hanagal	Haven	Karnataka
S8	Mundgod	Uttara Kannada	Karnataka

found to play great role in seed germination, survival and seedling growth (Pathak *et al.*, 1980). Source variation tests are necessary to screen the naturally available genetic variation to select the best planting material for higher productivity (Bhat and Chauhan, 2002). In this study, an effort has been made to evaluate the extent of variation among the seed sources with

respect to different seed and seedling traits. An experiment was conducted during 2005-06 at Department of Agro-forestry, College of Forestry, Sirsi. The seeds of *Pongamia* were collected from eight different locations falling under tropical climates as enlisted in table 1. Initially, seeds were measured for seed length, width and 100 seed weight. The seeds were sown in polybags in a randomized block design. Daily germination was recorded and seed sources were assessed for germination per cent and observations were also recorded on growth parameters like seedling height, collar diameter, number of nodes and number of leaves per seedling. There was significant difference among seed sources for seed and seedling traits. seed length amongst the different sources used varied from 7.70 to 11.13 mm and seed width from 6.95 to 9.22 mm (Table 2). S₁ source excelled other seed sources for seed length and width. The 100 seed weight varied from 19.80 to 32.20 g the highest and lowest average 100 seed weight was observed in S₂ and S6, respectively. It is evident from the above that seed with higher weights, possessed higher seed length and width also. Results revealed wide range of variation in germination per cent (69.61 to 89.20) S₂ attained highest germination per cent (89.20) and was significantly differed from rest of the seed sources that is seed sources with heavier seeds possessed higher germination per cent than that of smaller and lighter seeds, may be because of more stored food in endosperm. Similar findings also reported by Dunlap and Barnett (1983) in *Pinus taeda* and Bhat and Chauhan (2002) in *Albizia lebbek*. The mean values for seedling height, collar diameter, number of nodes and number of leaves for eight sources were presented in table 2, indicated significant differences between seed sources for all these growth parameters

Table 2. Variation in seed and seedling parameters among different seed sources of *Pongamia pinnata*

Seed sources	Seed length (mm)	Seed width (mm)	100 seed weight (g)	Germination per cent	Seedling height (cm)	Collar diameter (cm)	No. of nodes	No. leaves
S 1	11.13	9.22	31.30	79.88	11.85	0.33	15.08	10.90
S2	9.18	7.31	32.20	89.20	13.95	0.19	16.43	11.19
S3	8.95	8.55	25.60	73.10	10.25	0.19	14.90	10.95
S4	8.10	7.12	19.80	69.15	8.75	0.16	13.22	9.89
S5	8.90	7.81	23.30	77.39	11.50	0.18	12.66	10.05
S6	7.70	6.95	23.00	71.10	5.75	0.14	10.31	9.65
S7	9.15	7.28	29.20	69.61	8.40	0.15	13.95	10.57
S8	8.31	7.29	23.30	75.50	10.75	0.20	11.89	10.33
Mean	7.14	6.15	20.77	60.46	8.12	0.15	10.84	8.35
SEm ±	0.10	0.05	1.22	4.11	2.81	0.03	0.42	0.49
CD@5%	0.30	0.16	3.63	12.21	8.37	0.08	1.24	1.45
F test	1508.25	3496.8	90.40	62.15	2.92	13.40	203.40	82.77

studied. S_2 and S_6 attained maximum and minimum values respectively for seedling height, number of nodes and number of leaves. Collar diameter was found maximum and minimum for S_1 and S_6 , respectively. However, an overall consideration revealed that S_1 and S_2 seed sources were found superior to rest of the seed sources with respect to seedling growth parameters.

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These seed sources could be selected for further use in afforestation programme and for further breeding work. Since the superiority might be because of genetic makeup of these seed sources. Similar studies have been reported by Sneizo and Stewart, 1989) in *Pinus taeda*, Vakshasya *et al.* (1992) in *Dalbergia sissoo*, Bhat and Chauhan (2001) in *Albizia lebbek*.

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