

Intra-Population Variation in Mahua (*Madhuca longifolia* var. *latifolia* Roxb. A. Chev.) for Fruit, Seed and Germination Traits

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1. Introduction

There is a great demand for seeds and flowers of mahua for commercial purpose and required raw materials come from natural sources. Intra specific variation leads trees to show better phenotypic characters, resistance against the harsh conditions and biological agents. These characters would help to screen the best genotypes for the specific purpose. There is gap in information about intra-population variation for morphometric distinction in fruit, seed and germination attributes in mahua (*Madhuca longifolia* var. *latifolia* Roxb. A. Chev.) and their correlation. Therefore, to fulfill some of these gaps in intra-population, variability studies in this high value tropical tree species was undertaken.

2. Material and methods

For this study, total ten accessions were selected in the focal population of mahua situated at Makadaban forest area of Dharampur taluka of southern Gujarat which is located in northern Western Ghats. Matured fruits of mahua were collected during June. Seedlots of individual tree identity was maintained and they were used for study. Data on various quantitative traits of fruits and seeds like length, thickness and weight were recorded for all the accessions. Germination experiment was carried out in the nursery under shade-net area. Seedlings were raised in nursery in CRD to assess the seedling vigour.

Table 1. Variation in seed traits of *M. longifolia* var. *latifolia*

Open pollinated mother trees	Seed length (mm)			Seed thickness (mm)			Seed weight (g)		
	Year -1 (2015)	Year-2 (2016)	Pooled	Year -1 (2015)	Year-2 (2016)	Pooled	Year -1 (2015)	Year-2 (2016)	Pooled
MLLMG-1	30.56	29.50	30.03	17.06	12.19	14.63	4.60	3.44	4.02
MLLMG-2	26.42	32.60	29.51	14.70	15.18	14.94	2.84	5.05	3.95
MLLMG-3	33.26	32.90	33.08	18.95	14.03	16.49	5.26	5.09	5.18
MLLMG-4	29.64	31.70	30.67	17.87	14.37	16.12	5.14	4.91	5.03
MLLMG-5	25.08	29.30	27.19	16.65	13.48	15.07	3.74	3.72	3.73
MLLMG-6	26.00	31.60	28.80	16.25	11.35	13.80	3.69	3.56	3.63
MLLMG-7	25.66	25.30	25.48	17.93	11.40	14.67	4.55	2.99	3.77
MLLMG-8	28.10	31.40	29.75	15.22	13.02	14.12	3.59	3.79	3.69
MLLMG-9	29.92	25.40	27.66	16.46	15.27	15.87	3.98	2.96	3.47
MLLMG-10	28.30	29.60	28.95	16.06	15.49	15.78	3.95	3.28	3.62
Mean	28.29	29.93	29.11	16.72	13.58	15.15	4.13	3.88	4.01
SEm (±)	0.30	0.43	1.65	0.17	0.31	1.12	0.07	0.18	0.51
CD @ 5%	0.86	1.24	NS	0.48	0.90	NS	0.20	0.51	NS
CV (%)	2.35	3.24	2.85	2.23	5.17	3.63	3.78	10.18	7.49
SEm (±) (YxT)	-	-	0.37	-	-	0.24	-	-	0.13
CD @ 5% (YxT)	-	-	1.06	-	-	0.70	-	-	0.38

3. Result and Discussion

Various fruits and seed traits like length, thickness as well as weight showed significant variation among 10 studied individuals. Among ten individuals, trees coded with MLLMG-3, MLLMG-4 and MLLMG-1 yielded bigger and bolder seeds than other trees; in fact, seed weight of these trees were almost double than seeds of MLLMG-2 tree. Germination and its parameters also showed significant variation among ten individuals, where germination ranged between 56.25 and 93.00 per cent. However, mean germination time ranged from 15.33 to 18.95. It is divulged that the overall increment of seedling height and collar diameter was 5.84 cm and 2.80 mm, respectively within six months, where seeds collected from MLLMG-1 tree resulted in highest seedling growth and biomass, followed by MLLMG-4. Variations in the fruit and seed sizes could be due to genetic potential among the selected individuals or it may be due to the differences in microsite environmental as well as edaphic factors in which the mother trees grow. On other hand, the character of maternal and paternal parent also influences seed and seedling traits due to the nature of cross pollination in forest species. Study revealed about the existence of strong within-population variation for various fruit, seed, germination and seedling vigour attributes in mahua ($P < 0.05$). Therefore, further selection and improvement work can be done on this species for production of quality seeds in large quantity to fulfill various demands.

References

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