

## *Madhuca indica*

Collecting partner	S.C. Naithani. Seed Biology Lab. School of Life Sciences Pt. Ravishankar Shukla University Raipur – 492 010 (M.P.) India						
Collection date	June 10 <sup>th</sup> (desiccation trial) and June 26 <sup>th</sup> (storage trial) 2000						
Seed source	Village Attari, District Raipur, 7 km from Pt. Ravishankar Shukla University						
<b>Initial trials</b>							
Fruit weight	15.8 ± 2.8 g						
Seed weight	3.3 ± 0.9 g						
Seed size (length/breadth)	3.7 ± 1.2 / 1.8 ± 0.4 cm						
	Fruit	Seed coat	Embryo	Embryonic axis	Cotyledons		
Mc (%)	68.0 ± 3.1	63.8 ± 1.0	57.2 ± 3.4	65.2 ± 4.2	46.9 ± 3.1		
Mc before processing (%)	54.8 ± 3.2						
Initial germination (%)	100						
<b>Desiccation trial</b>							
Mc after desiccation (%)	53.0±2.6	48.0±0.4	37.7±3.6	28.4±4.0	14.8±2.1	9.4±2.3	4.8±0.2
Germination (%)	<b>100</b>	<b>100</b>	<b>89</b>	<b>40</b>	<b>10</b>	<b>0</b>	<b>0</b>
<b>Storage trial</b>							
Mc before storage (%)	53.0 ± 2.6	48.0 ± 0.4	37.7 ± 3.6	28.4 ± 4.0			
Storage period	3 days						
Germination (%) after storage at -20°C	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>			
Mc (%) after storage	55.2 ± 2.3	50.1 ± 3.1	35.2 ± 1.4	28.7 ± 3.1			
Germination (%) after storage at 0°C	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>			
Mc (%) after storage	53.1 ± 2.1	47.8 ± 4.8	35.2 ± 2.3	28.3 ± 0.4			
Germination (%) after storage at 15°C	<b>100</b>	<b>40</b>	<b>40</b>	<b>40</b>			
Mc (%) after storage	54.4 ± 2.7	48.3 ± 4.8	34.7 ± 0.6	28.5 ± 0.7			
Germination (%) after storage at 25°C	<b>100</b>	<b>100</b>	<b>14</b>	<b>20</b>			
Mc (%) after storage	45.5 ± 1.8	41.6 ± 3.0	31.7 ± 1.1	28.0 ± 3.4			
Storage period	30 days						
Germination (%) after storage at -20°C	-	<b>0</b>	<b>0</b>	<b>0</b>			
Mc (%) after storage	-	51.8 ± 0.9	32.7 ± 1.9	30.1 ± 2.2			
Germination (%) after storage at 0°C	-	<b>0</b>	<b>0</b>	<b>0</b>			
Mc (%) after storage	-	48.6 ± 1.8	31.9 ± 3.4	25.8 ± 1.6			
Germination (%) after storage at 15°C	<b>35</b>	<b>20</b>	<b>5</b>	<b>0</b>			
Mc (%) after storage	49.4 ± 2.3	40.8 ± 4.8	21.8 ± 3.6	15.2 ± 3.1			
Germination (%) after storage at 25°C	<b>10</b>	<b>5</b>	<b>0</b>	<b>0</b>			
Mc (%) after storage	17.2 ± 1.6	15.2 ± 4.2	12.2 ± 2.7	9.9 ± 2.3			
Storage period	60 days – all dead						
<b>Comments and conclusions</b>	The seeds were sensitive to drying below approx. 40% moisture content, and did not tolerate even short storage at -20°C and 0°C. Viability was lost fast, after 30 days of storage at 15°C, only 35% of the seeds stored at the highest moisture content germinated. After 60 days, all seeds were dead, and moisture contents had decreased significantly.						

**Madhuca indica - 2001 collection**

Collecting partner	S.C. Naithani. Seed Biology Lab. School of Life Sciences Pt. Ravishankar Shukla University Raipur – 492 010 (M.P.) India									
Collection date	June 27, 2001									
Seed source	Village Pithora, District Mahasamund									
<b>Initial trials</b>										
Fruit weight	1.0 ± 2.9 g									
Seed weight	3.5 ± 0.8 g									
Seed size	3.1 ± 0.35 x 1.5 ± 0.18 cm									
	Whole fruit			Seed coat	Embryo	Axis	Cotyledons			
Mc (%)	73.4 ± 3.6			63.4 ± 3.1	57.8 ± 0.8	66.6 ± 3.5	47.6 ± 0.4			
Mc after processing (%)	63.2 ± 0.96									
Initial Germination (%)	100									
<b>Desiccation trial</b>										
Mc after desiccation (%)	53.3±2.9	51.7±0.9	43.6±2.2	37.2±2.6	31.3±3.0	30.5±2.5	26.2±1.8	18.3±0.9	9.4±2.9	
Germination (%)	<b>100</b>	<b>100</b>	<b>95</b>	<b>80</b>	<b>75</b>	<b>60</b>	<b>40</b>	<b>10</b>	<b>0</b>	
<b>Storage trial</b>										
Mc before storage (%)	63.2±1.0	53.3±2.9	51.7±1.0	43.6±2.2	37.2±2.6	31.3±3.0	30.5±2.5	26.2±1.8	18.3±0.9	
Germ. before storage	<b>100</b>	<b>100</b>	<b>100</b>	<b>95</b>	<b>80</b>	<b>75</b>	<b>60</b>	<b>40</b>	<b>10</b>	
Storage at 25°C										
Mc after 10 days (%)	59.6±5.1	55.7±1.8	52.3±1.8	44.2±2.0	40.9±3.9	34.1±1.0	30.6±4.0	26.7±2.7	21.9±3.8	
Germ. after 10 days (%)	<b>75</b>	<b>50</b>	<b>70</b>	<b>90</b>	<b>65</b>	<b>45</b>	<b>30</b>	<b>10</b>	<b>0</b>	
Mc after 20 days (%)	61.0±1.2	57.8±2.9	54.3±3.5	45.3±3.6	37.3±2.1	34.7±5.6	22.9±1.9	18.6±1.2	-	
Germ. after 20 days (%)	<b>40</b>	<b>20</b>	<b>40</b>	<b>75</b>	<b>40</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>-</b>	
Mc after 30 days (%)	60.9±3.1	55.5±2.5	54.7±1.9	44.6±5.3	34.5±9.5	34.2±3.1	-	-	-	
Germ. after 30 days (%)	<b>10</b>	<b>10</b>	<b>20</b>	<b>55</b>	<b>20</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Mc after 40 days (%)	60.1±4.2	56.1±2.5	54.0±3.0	41.3±3.3	34.7±6.9	-	-	-	-	
Germ. after 40 days (%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>5</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Mc after 55 days (%)	-	-	49.2±1.9	42.7±2.8	31.8±0.8	-	-	-	-	
Germ. after 55 days (%)	<b>-</b>	<b>-</b>	<b>0</b>	<b>25</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Storage at 15°C										
Mc after 10 days (%)	60.9±3.4	52.0±1.0	50.9±3.0	43.2±1.7	38.1±4.5	34.4±5.7	29.4±5.5	25.2±2.8	19.2±0.2	
Germ. after 10 days (%)	<b>55</b>	<b>50</b>	<b>65</b>	<b>80</b>	<b>40</b>	<b>35</b>	<b>35</b>	<b>0</b>	<b>0</b>	
Mc after 20 days (%)	58.7±0.9	53.3±3.6	51.9±1.8	45.5±2.5	44.4±3.9	34.2±1.5	26.2±2.0	-	-	
Germ. after 20 days (%)	<b>15</b>	<b>20</b>	<b>35</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>-</b>	
Mc after 30 days (%)	59.9±3.0	55.9±4.0	51.7±0.5	44.2±6.1	-	-	-	-	-	
Germ. after 30 days (%)	<b>0</b>	<b>0</b>	<b>10</b>	<b>25</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Mc after 40 days (%)	-	-	49.8±2.9	44.9±1.4	-	-	-	-	-	
Germ. after 40 days (%)	<b>-</b>	<b>-</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Storage at 0 °C										
Mc after 10 days (%)	58.7±3.1	55.1±3.4	51.8±2.1	42.0±1.2	39.4±3.7	35.0±1.9	28.9±0.8	26.4±1.2	18.0±1.5	
Germ. after 10 days (%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
Storage at -20 °C										
Mc after 10 days (%)	59.2±2.9	54.2±1.9	52.7±3.4	44.6±1.2	41.2±3.1	36.8±2.9	29.4±1.5	22.2±1.8	19.8±2.1	
Germ. after 10 days (%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Comments and conclusions</b>	<p><i>Madhuca indica</i> seeds are shed at 63.2% mc and showed 100% initial Germ.. Rapid desiccation to 43.6% reduced germinability to 95%. Further drying to 37.2, 31.3, 30.5, 26.2, 18.3 &amp; 9.4% mc resulted in 80, 75, 60, 40, 10 &amp; 0% Germ.. During storage trials, seeds desiccated to 43.6% mc survived longest i.e. for 55 days with 25% Germ. at 25°C. Viability was absolutely lost when undried and dried seeds were stored at -20 &amp; 0 °C. Storage of seeds at 15 °C showed reduced survival for limited period. <i>Madhuca indica</i> seeds may be categorised as true tropical recalcitrant as they are highly sensitive to desiccation and chilling temperature.</p>									