



## Influence of seed extraction methods on seed quality of neem (*Azadirachta indica* A. Juss)

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**Abstract:** The HCl scarified seed (con.HCL @ 80 ml kg<sup>-1</sup> of uncleaned seeds for 1 min.) recorded higher germination and seedling vigour compared to hand cleaned and uncleaned seeds, besides improving the physical appearance. The seeds scarified using con. H<sub>2</sub>SO<sub>4</sub> @ 80 ml kg<sup>-1</sup> uncleaned seeds for 1 min. recorded the lowest germination and vigour index.

**Key words :** *Azadirachta indica*, Seed extraction, Germination, Vigour index.

### Introduction

The neem tree (*Azadirachta indica* A. Juss) is widely found from Kanyakumari to Himalayan hills, in tropical to subtropical regions, in semi arid to wet tropical regions 700 MSL elevation. Maceration followed by incubation and fermentation is the method for extraction of seeds from fleshy fruits like pears, mulberries and oranges (Schopmeyer, 1974). Maximum germination of seeds treated with concentrated H<sub>2</sub>SO<sub>4</sub> for 8 min. at alternating temperature

was reported in *Albizia lebbbeck* (Khan and Tripathi, 1987). Ponnusamy (1993) reported that cleaned and bleached seeds were superior in seed quality compared to fresh uncleaned seeds. Removal of mesocarp by any method incidentally removes the inhibitors and enhances germination and vigour. Similar findings have been reported in *Ailanthus excelsa* (Ramakrishnan, 1988) and *Calophyllum* sp (Vanangamudi *et al.* 1984). In neem (*Azadirachta indica* A. Juss) extraction of seed from the matured drupes are time consuming and difficult.

S.No.	Seed extraction methods	Abbreviation
1.	Macerated with hand, washed, cleaned and air dried to 12-13% moisture-hand cleaned seed	T <sub>1</sub>
2.	HCl treatment to the uncleaned seed (extracted with intact mesocarp by gentle squeezing with hand-uncleaned seed) @ 80 ml kg <sup>-1</sup> of uncleaned seed for 1 min. washed and dried to 12-13% moisture-HCl scarified seed	T <sub>2</sub>
3.	Extracted with intact mesocarp by gentle squeezing with hand-uncleaned seed	T <sub>3</sub>
4.	Macerated with hand and cleaned by sterilizing it with 0.5% MgCl <sub>2</sub> for 10 min and dried to 12-13% moisture-hand cleaned and sterilized seed	T <sub>4</sub>
5.	Concentrated H <sub>2</sub> SO <sub>4</sub> treatment to the uncleaned seed @ 80 ml kg <sup>-1</sup> of uncleaned seed for 1 min, cleaned and dried to 12-13% moisture-H <sub>2</sub> SO <sub>4</sub> scarified seed	T <sub>5</sub>
6.	HCl treatment to the uncleaned seed @ 80 ml kg <sup>-1</sup> for 1 min followed by treating the seed with 0.5% MgCl <sub>2</sub> for 10 min-HCl scarified and sterilized water	T <sub>6</sub>
7.	Concentrated H <sub>2</sub> SO <sub>4</sub> treatment to the uncleaned seed @ 80 ml kg <sup>-1</sup> for 1 min followed by treating the seed with 0.5% MgCl <sub>2</sub> for 10 min - H <sub>2</sub> SO <sub>4</sub> scarified and sterilized seed	T <sub>7</sub>

Table 1. Effect of seed extraction methods on neem seed quality

Treatments	Germination (%)	Root length (cm)	Shoot length (cm)	Drymatter production (g seedling <sup>-1</sup> )	Vigour index
	89.5 (71.1)	4.0	13.1	0.107	9.6
	90.0 (71.6)	4.2	14.6	0.112	10.1
	85.5 (67.6)	4.0	13.1	0.107	9.2
	86.0 (68.0)	3.9	13.0	0.105	9.0
	82.0 (64.9)	4.0	13.1	0.109	9.0
	83.5 (66.0)	3.9	13.0	0.105	8.7
	79.5 (63.1)	3.9	13.0	0.104	8.3
Mean	85.1 (67.5)	4.0	13.3	0.107	9.1
SEd	2.284	0.239	0.466	2.138	0.224
SD (P=0.05)	5.400	NS	1.101	NS	0.529

Figures in parentheses indicate arcsine values)

Presently the greenish yellow neem drupes were macerated with hand, washed and dried. However this method of seed extraction affects the germinability and vigour potential of neem seeds because of the inhibiting effect of mucilage substances which adhere over the stone surface. Hence, the attention has been focused to extract the seeds quickly without much reduction in initial seed germination and vigour potential besides improving the physical appearance.

### Materials and Methods

An experiment was conducted at Department of Seed Science and Technology, Tamil Nadu Agricultural University during the year 1999-2000. The seeds extracted and conditioned using the following methods were evaluated for seed quality.

The design adopted for this study was CRD. Seeds 4 x 100 were sown in sand medium and the observations on seed quality namely germination (ISTA, 1999) root and shoot length, drymatter production and vigour index (Abdul-Baki and Anderson, 1973) were recorded on final count day.

### Results and Discussion

Significant differences in germination per cent, shoot length and vigour index were observed for seed extraction methods (Table 1). The

root length drymatter production did not show significant differences.

### Germination

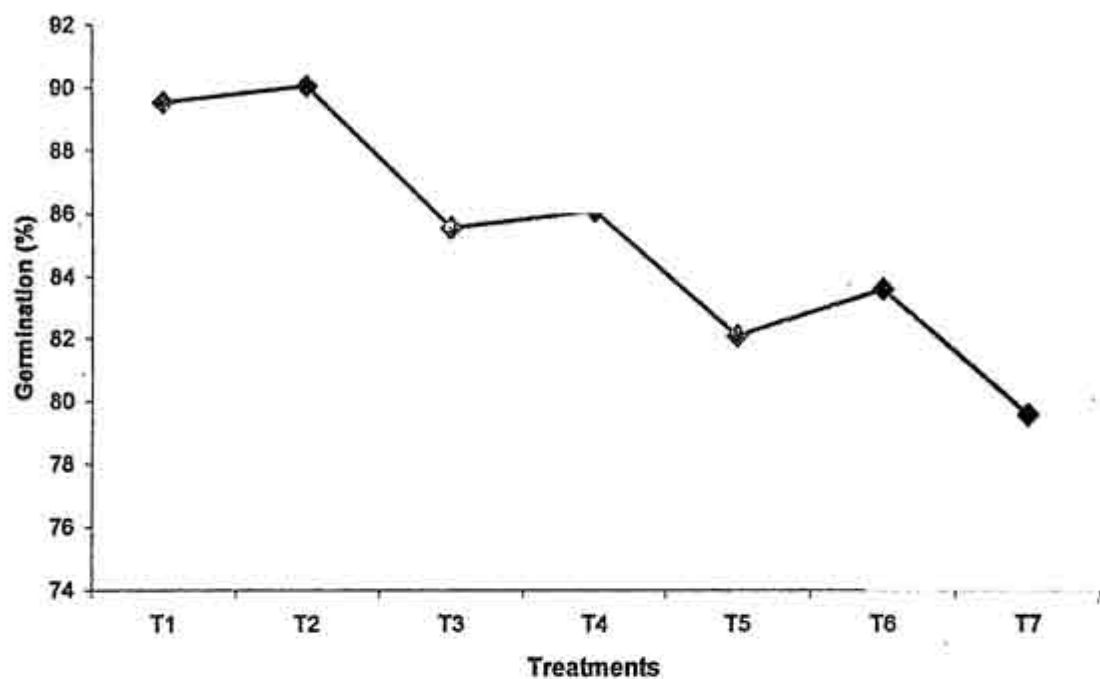
The highest germination of 90 per cent was recorded by the treatment T<sub>2</sub> (HCl scarified seed) whereas, the uncleaned seeds treated with concentrated H<sub>2</sub>SO<sub>4</sub> (T<sub>7</sub>) recorded the lowest germination of 79.5 per cent. The seeds of the remaining treatments registered high germination, ranging from 82 to 89.5 per cent, however the treatments T<sub>1</sub> to T<sub>4</sub> were on par with each other.

### Seedling vigour

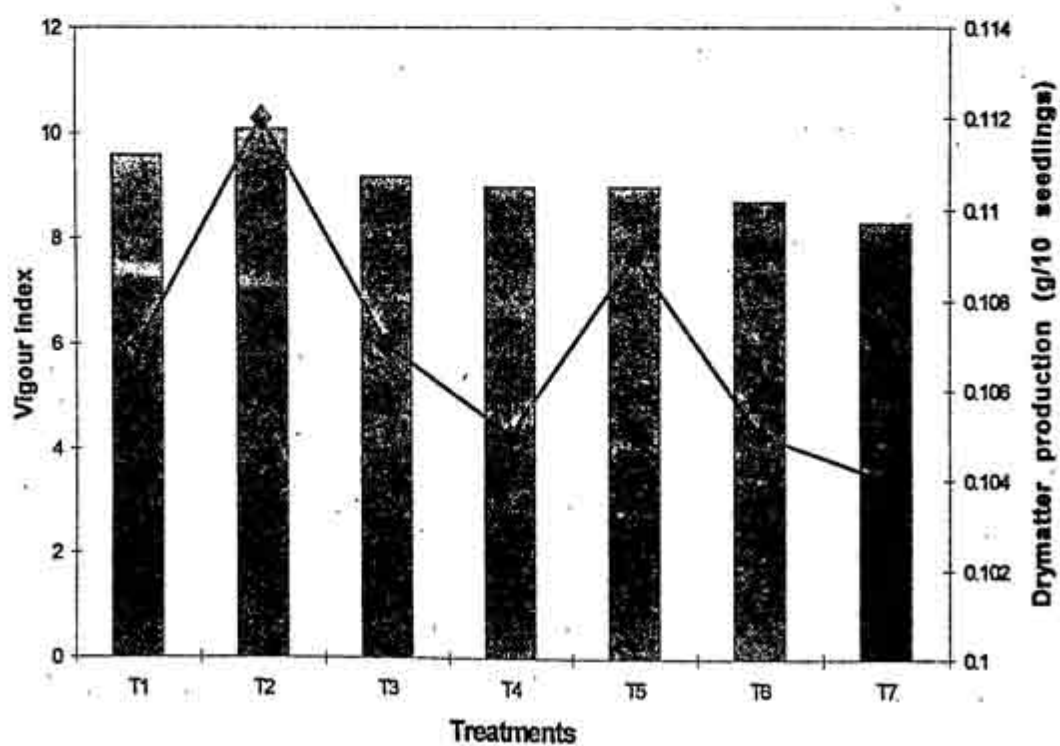
The higher root length (4.2 cm), shoot length (14.6 cm), drymatter production (0.112 g) and vigour index (10.1) were recorded by the treatment T<sub>2</sub> (HCl scarified seed). The control seed (T<sub>1</sub> - fruits macerated with hand, washed, cleaned and air dried to 12-13 per cent moisture recorded only 4.0 and 13.1 cm respectively root and shoot length, 0.10 mg drymatter production and 9.6 vigour index. The lowest vigour index of 8.3 was recorded by the treatment T<sub>7</sub> (H<sub>2</sub>SO<sub>4</sub> scarified and sterilized seed).

Seed extraction methods employed in the present study to assess seed quality improvement clearly indicated that the HCl scarified seed (Con. HCl @ 80 ml kg<sup>-1</sup> of uncleaned seeds

### Effect of seed extraction methods on germination of neem



### Effect of seed extraction methods on vigour index and dry matter production of neem



one minute) recorded higher germination and vigour compared to fresh hand cleaned and uncleaned seeds. The major factor attributed to high germination and vigour was the complete removal of mesocarp which ultimately removes the inhibitors thereby increasing germination and vigour potential. Similar positive results due to bleaching treatment was reported by Ramakrishnan (1990) in *Ailanthus excelsa*. Vanangamudi *et al.* (1984) in *Calophyllum*. The lowest germination and vigour index was recorded in the seed scarified using con.  $H_2SO_4$  @ 80 °C for about 1 min, which might be due to the scorching effect.

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