Indian Forester, **140** (11) : 1142-1144, 2014
http://www.indianforester.co.in

ISSN No. 0019-4816 (Print)
ISSN No. 2321-094X (Online)

RESEARCH NOTES

(I)

DIVERSITY IN *BALANITES AEGYPTIACA* : A LESSER KNOWN TREE SPECIES IN THE YAMUNA RAVINES

Balanites aegyptiaca also known as 'desert date', it is an important native tree species of the Sudan and belongs to *Zygophyllaceae* or *Balanitaceae*. It is also found India, Iran and Pakistan (Amalraj and Shankarnarayan, 1986). *B. aegyptiaca* had been used over thousands of years in arid zone regions of the world (Von Maydell, 1986). It has wide ecological distribution; well grown on low-lying, level alluvial sites with deep sandy loam and uninterrupted access to water such as valley floors, riverbanks or the foot of rocky slopes. Fruit is 4-5 cm long, green, brown or pale brown with a brittle coat enclosing a brown or brown-green sticky pulp and a hard stone seed and seeds weigh 500-1500/kg. The fleshy pulp of the fruit is eaten fresh or dried. This fruit contains 64 -72% carbohydrates, plus crude protein, steroidal saponins, vitamin C, ethanol and other minerals (Abu Al-Futuh, 1983). It is widely used as good firewood and charcoal; edible fruit and nuts have 30-40 % of edible oil (Dubey *et al.*, 2011). Both fruits and kernel were widely used as livestock feed in many countries during the dry season and drought periods in the dry tropical region (Schimdt and Joker, 2000), and the kernel represents 15% of fruit (Elfeel and Warrag, 2006). In the Yamuna ravines, *B.aegyptiaca* has widely and naturally colonized with higher densities at ravine valleys. Within the species, there is evidence showing the occurrence of a number of local forms differing in habit, size, quality of the fruit and nut characters. Knowledge of this existing genetic variation within the species is essential to design a strategy to promote the use and conservation of indigenous fruit trees meant for on-farm cultivation.

An intensive survey was conducted at 85 ha of ravine land area which it is located inside CSWCRTI, research farm at Chhalesar in Agra district and it is core part of typical Yamuna ravine. The study site is located at 23°52' to 31°28' N latitudes and 77° 06' to 84° 37' E longitudes and 169 m amsl with high terrain undulated topography. It has humid sub-tropical climate with high variation between summer and winter temperatures. The average temperature is 32°C - 47°C in summer; 10°C-15°C in the winter. The average annual rainfall is 550 mm. A total of eight superior CPTs were selected and marked based on comparison / check tree selection method using the following morphological features viz., height, basal girth, number of branches, free from pest and disease. The selected trees are referred as candidate plus trees (Zobel and Talbert, 1984). The selected CPTs were given with the accession numbers based on the region from which they were selected. The fruit were collected from identified individual plus trees. The selected trees were widely spaced between each other to avoid collecting fruits from related trees. Fruits of each tree were kept separate as an open-pollinated family. The bulk quantity of the fruits were collected separately for each of trees and then fruits were soaked individually in cold water for 3 days and washed several times to obtain the nuts. The fruit and nuts were showing peculiar morphological variation in size, shape colour and weight. The salient features of the CPTs fruit parameters were presented in Table 1.

The observed wide variability suggests genetic differences between individual trees within location. Determining this genetic variation is very important for improvement and domestication of this species based on fruit and seed parameters (Zobel and Talbert, 1984). On the basis of fruit variation among the natural populations of *Balanites agyeptiaca* in the Yamuna ravines, eight phenotypically superior genotypes were identified with accession numbers viz., YRBA-1, YRBA-2, YRBA-3, YRBA-4, YRBA-5, YRBA-6, YRBA-7 and YRBA-8. The table 1 and Fig.2 exhibits the ambient morphological variation in fruit length (cm), fruit diameter (mm), fruit weight (g), shape, size, colour, fruit end, ridge pattern on fruit by horizontal and vertical view. These CPTs could be considered / utilized for hybridization or other tree improvement programmes in this species. Since the size of the fruit, nuts and kernel are considered to be important parameters in marketing and other utility points. Obviously, the phenotypic variances were ultimately expressing their genotypic variances revealing that the selection on the basis of phenotypic performance can be equally effective to that of genotypic performance. Several authors also conducted similar study and results were reported for fruit length, fruit diameter and fruit weight in *Populous deltoids* by Varma and Bangarva (2007), in *Emblica officinalis* by Pandey *et al.* (2008), in *Jatropha curcas* by Rao *et al.* (2008), in *Madhuca latifolia by* Divakara and Krishnamoorthy (2009) and in *Pongamia pinnata* by Divakara *et al.* (2010).

The first report of informations among the natural