Chapter 1

Introduction
Chapter-I

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Guava (*Psidium guajava* L.), the champion fruit from family Myrtaceae, is known as poor-man’s apple due to low fetching prices. It is one of the most referred and legendary fruits because of its hardy (Dhaliwal and Singla, 2002) and prolific bearing nature. It is an excellent source of Vitamin C and pectin content (Dhaliwal and Dhillon, 2003). It is also a good source of other vitamins (A, B, & B₂) and minerals like calcium, iron and phosphorus. Seeds of the fruit are also rich source of iron. Guava fruits, after removal of seeds are used for preparation of processed products like jam, jelly, paste, juice and nectar in addition to fresh consumption. Guava production is vital for overall growth of horticulture in India as it contributes 4% of the total fruit production (Singh, 2009).

Fig-1: Contribution of different fruits to fruit production scenario in India

In the world, guava is one of the most important fruit crops. It is believed to be originated in tropical America stretching from Mexico to Peru. India contributes 45% of world production of guava after China (10%) and Thailand (6%) (NHB DATABASE 2010).
In India it is cultivated in an area of 219.7 th ha with a total production of 2571 th MT of fruit (NHB DATABASE 2010). The major guava growing states are Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Maharashtra. But best quality of guava is produced in Uttar Pradesh particularly in Allahabad. Guava is an important fruit crop which is successfully grown over a wide range of climatic conditions due to its greater adaptability. The Chotanagpur region of eastern plateau and hills agro-climatic zone has been a traditional guava growing region where the crop is mostly grown under rainfed conditions. The guava produced in this region is known for its high TSS and long keeping quality. However, lower yield level of guava under this conditions (around 20 kg/plant) as compared to that under other regions like Uttar Pradesh and West Bengal (around 80 kg per plant) resulting in lower profitability of guava orcharding. It is a major constraint for spread of guava orcharding in this region. With burgeoning population, urbanization and continuous depletion of natural resources there is a paradigm shift to production and profitability. In a state like Jharkhand, more than 60% of land is rainfed upland which is generally utilized under monocropping of paddy. Under this situation, drought hardy and precocious bearing fruit crops like guava can play a major role in increasing the land use efficiency by virtue of the ease in establishing guava orchard, earliness in providing economic yield (starts bearing after second year) and accommodation of more number of plants per unit area due to dwarf stature of guava plants. Evaluation of guava to select a particular genotype for certain region for recommendation is gaining importance. Numerous seedling selections have gained the status of commercial genotypes of India, South East Asia, South Africa, Mexico, West Indies, Florida and Hawaii (Shigaura and Bullock, 1976) when these excel most other guava genotypes in term of
productivity and physico-chemical characters. Maintenance of superior genotypes in respect of fruit and other characters for further crop improvement programme is essential. The ease in cultivation and precociousness of guava under this condition makes it a suitable option for increasing the paddy equivalent yield of existing agriculture production system in this low soil fertility zone. Thus development of guava genotypes with higher yield potential under the eastern plateau condition is one of the important strategies for increasing the profitability of guava orcharding in the region. Previous studies on climatic influences on productivity of guava have indicated alteration in plant growth periodicity of same guava genotype under different soil and climatic condition. Alteration in plant phenological behaviour may result in alteration in productivity behaviours of a plant under given soil and climatic condition. An insight into relationship between plant productivity and phenological behaviour will help in designing crop manipulation strategies for increasing productivity. For crop improvement programme aiming at development of model plant ideotype in guava, a proper understanding of interaction between plant growth processes and yield is highly essential. However, some long standing problems such as lack of dwarf and prolific fruit bearing genotypes, guava wilt disease resistant / tolerant and lack of soft seeded, coloured genotypes require urgent attention of researchers. There is a need to develop genotype resistant to guava wilt through hybridization or screen out from existing population. Estimation of genetic divergence and therefrom clustering of guava genotypes into homogenous clusters will help in designing hybridization programme for harnessing heterosis and hybrid vigour. A study in that direction will provide ample opportunity to the researchers to understand different guava genotypes and their close association with particular characters. Again, with recent emergence of technologies on high density orcharding in guava, the need for better understanding into plant growth relationship with productivity has become imperative of this important fruit crop.

Keeping the above point in view, the present investigation was undertaken to evaluate guava germplasm on the aspect of nutritive quality and acceptability under subtropical sub humid climate like Jharkhand with following objectives.
Objectives:

1. To characterize guava genotypes based on plant morpho-phenological productivity parameters and fruit quality attributes;
2. To estimate the genetic divergence in different guava genotypes;
3. To delineate the contribution of different morpho-phenological factors on productivity and quality attributes of guava genotypes.