Eggplant (*Solanum melongena* L.) also known as brinjal is an indigenous tropical vegetable crop of India grown in an area of 0.51 million hectare with an annual production of 90.4 million tonnes. Brinjal is grown in almost all the states with distinct preferences for the types and occupies 14 per cent of total area under vegetable cultivation in India. Major brinjal producing states are West Bengal, UP and Bihar. Brinjal is also popular in the South and Southeast countries (Pakistan, Bangladesh, Srilanka, Thailand, Philippines and Indonesia), China, Turkey, and Egypt and to a small extent in Mediterranean countries. On a world scale it occupies an area of 1.74 million hectare with annual production of 331.6 million tonnes (Anonymous, 2005). Brinjal is the staple vegetable of India since ancient times. It is consumed as a cooked vegetable in various forms. Contrary to the common belief, it possesses high nutritive value (particularly protein, calcium, phosphorus and iron) comparable to tomato. It is equally liked by both poor and rich people (Choudhary, 1976). Brinjal has been reported to have ayurvedic medicinal properties (Singh et al., 1963). The consumption of brinjal improves appetite, works as cardio tonic, laxative, analgesic, maturant, enriches blood, cures toothache, and act as remedy for liver disorders. The seeds of brinjal act as stimulant and its leaves as narcotic. White brinjal is belived to be good for diabetic patient.

India, being the centre of diversity of this crop (Ganabus, 1964), provides a large amount of variation, which promises a vast opportunity for its genetic improvement. It belongs to the family Solanaceae, subfamily solanoideae, genus *Solanum*, and species *melongena*. *Solapum* taxa are an enormous one with large
number of species. Among the twenty-two Solanum species, there is a group of five related species, all prickly and diploids with 2n =2x=24, namely melongena, coagulants, zanthocarpum, indicum and maccanii. Other important allied species are S. sisymbriifolium, S. khasianum, S. gilo, S. intergrifolium and S. incanum. Another important species of Solanum is S. tuberosum (potato), which is widely cultivated throughout the world. Almost all the cultivars of brinjal belong to the species melongena. There are three main botanical varieties under the species melongena. The round or egg shaped cultivars is grouped under variety esculentum. The long slender varieties are included under serpentinum and the dwarf brinjal varieties are put under depressum. A number of brinjal hybrids and open pollinated cultivars are under cultivation throughout the country which differ based on yield, fruit quality parameters (taste, seed to pulp ratio, keeping quality, moisture content and blossom end scar) and consumer’s preference (fruit colors, shape, size, spininess, etc). Normally spiny and variegated with varied colour intensity of brinjal cultivars are popular in southern and western parts (Karnataka, Tamilnadu, A.P., and Maharashtra) while non-spiny are popular in north India. Black-fruited brinjal are common in Gujrat, Rajasthan and Chhatisgarh. Purple-fruited brinjal are more common in West Bengal, Haryana, and Punjab, UP, Bihar, Jharkhand and Orissa. Pink fruited are more common in UP, Bihar, Chhatisgarh, Gujrat and AP. Green fruited are more common in Bihar, UP, AP, Karnataka and Orissa. White are rare and grown in Chhatisgarh. Big round to oblong types of brinjal is used for bharta making, long types in curries and small choo-choo in stuffed preparations. Quality of fruits play major role in determining its market rate. Consumer quality parameters include uniform fruit colour, shining with green calyx, small blossom end scar with less seed content whereas for middleman transportation quality for long distant market is of
prime importance. Firm fruit (high volume) with good keeping quality are the requirement for long distant transportation. Sometimes different shades are found even among the fruits of same cultivars due to varying proportion of anthocyanin and chlorophyll in the skin of fruits. The bitter taste of some cultivars is due to the presence of glycoalkaloids.

Heritability, genetic advance, correlation studies and path coefficient analysis in brinjal are important to formulate an effective selection program. Selection in one character may result in progress for all positively correlated characters and vice-versa. These inter relations suggest the advantage in selecting more than one character at a time.

Diallel crossing is an important technique (Jinks and Hayman, 1953; Hayman, 1954 a, b; Jinks, 1954 and Griffing, 1956a, b) to study the combining ability and types of genetic variation. Information regarding the general combining ability and specific combining ability, the types of gene effects influencing various traits enables the plant breeder to choose outstanding parental material and formulate suitable breeding programme for further improvements.

Brinjal has wide popularity and therefore spatial and continued attention is required in improving its yield and quality. Study of various economic important characters of brinjal and understanding the genetic behavior is essential for characterization and adequate analysis. Heterosis breeding is one of the approaches to exploit hybrid vigor. Shull (1914) first coined the term heterosis. Heterosis is the superiority or inferiority of F\textsubscript{1} hybrids over mid parent in term of yield and various other attributes. Negative heterosis is utilized for certain traits such as earliness (days to first fruit picking), days to 50 per cent flowering, non setting flowers, moisture content of fruit, seed to pulp ratio, number and yield of unmarketable fruits in parents.
Under present circumstances standard heterosis has commercial application rather than relative and heterobeltiosis. Exploitation of heterosis in brinjal has been emphasized by various workers in India and abroad with respect to a number of characters.

However, the genetic information on commercially important traits in brinjal is rather meager and limited.

Keeping this in view, the present investigation was undertaken with the following objectives:

1. Expression of important characters association and path coefficient in $F_1$.
2. To analyse the basis of heterosis through estimates of components of genetic variance.
3. To identify parents with good GCA and cross combination with good SCA.
4. To identify better performing $F_1$ hybrids over standard checks along with good general combining ability and quality traits.