Summary
&
Conclusion
Mulberry leaf is the exclusive food of silkworm *Bombyx mori* L. and naturally, its quality plays a vital role in healthy growth of larvae and finally the quality of the cocoons produced. Maximization of leaf yield per unit area with maximum cocoon yield of better quality, which will fetch a reasonable price, is the ultimate need of the present day mulberry research. However, the raw silk produced in India presently is of low grade at the International market when compared to other countries. This enhances the foreign trade of India.

Quantitative and qualitative improvement of mulberry varieties and silkworm breeds may alone not support the development of sericulture industry. Exploitation of high yielding mulberry varieties and silkworm breeds under different agro-climatic conditions of the country may boost the sericulture industry in different zones of the country. In view of this, the present study has been taken up. Though several evaluating studies were reported, studies conducted exclusively for different agro-climatic conditions were limited. With the view to explore the possibility of isolating a profitable mulberry culture which would produce more leaf of good quality for silkworm rearing, under semi arid conditions, the study was carried out at S.K.University, Anantapur during 1999-2002. The study involved the evaluation of different mulberry genotypes under semi arid conditions concerning their yielding, nutritional status as well as the rearing performance after feeding these varieties on the development of larvae and resulting cocoons. The mulberry varieties namely S13, S30, S34, S36, V 1, Anantha, MR2 and K2 (Control) were raised in the experimental plot, following Randomized Block Design under irrigated condition. The studies on propagation characters were conducted in the nursery. Other parameters such as growth, leaf yield and qualitative assay of leaf were studied on the plants raised in experimental plot as per the standard procedures. Finally, the
mulberry leaf produced from the experimental plot was used for the silkworm rearing trails.

Rooting and sprouting were considered to represent propagation characters. The propagational studies were conducted for two seasons covering rainy and summer seasons. Rooting differed significantly between varieties, seasons and variety x season interaction. All the varieties showed lower values than the control K 2. In case of sprouting varietal and seasonal difference was significant. However, variety x season interaction was non-significant. The S13 variety showed higher values than the other varieties of study. In order to rank the mulberry varieties based on vegetative propagation characters, sensitivity analysis using MST software was used. The result revealed that S 13 and K 2 are ranked the first with least index value followed by V1, MR2 and S36.

Under the growth and yield parameters such as the longest shoot length, leaf area, leaf area index, hundred leaf weight, number of leaves per meter, leaf yield per plant, shoot yield per plant, biological yield and the harvest index were studied. The study was conducted for five seasons, and the mean values over the seasons were considered. Significant differences were observed between all varieties, seasons and varietal and the seasonal interaction was also significant. No significant difference was obtained for varietal x seasonal interaction with number of leaves per meter length. Anantha recorded the highest values for the longest shoot length, leaf area, leaf area index, leaf weight, leaf yield, shoot yield, biological yield. All the varieties showed higher values over the control variety K 2, except in the harvest index. The simple correlation of the growth and yield parameters revealed significant positive correlation between the longest shoot length, leaf area, leaf weight, leaf yield, shoot yield, biological yield, leaf area index
and the number of leaves per meter. However, the correlation was non significant with harvest index to all the other parameters. The sensitivity analysis for selection index values with MST software revealed Anantha variety with low index value with the first rank, followed by V 1, S13, S36 and MR2.

The chemical composition of mulberry leaf was studied in biochemical assay for moisture content, moisture content after 12 hrs of excision, total soluble proteins, total nitrogen, total crude protein, total soluble sugars, total carbohydrates, total crude fibre, total chlorophyll ‘a’ & ‘b’ and total chlorophyll contents. The Biochemical studies were taken up in three seasons i.e., rainy, winter and summer seasons respectively. All the parameters had shown significant varietal and seasonal differences. Varietal and seasonal interaction was also significant with all parameters except soluble sugars. The V 1 variety recorded higher values in moisture content, moisture content after 12 hrs of excision, total soluble proteins, nitrogen, crude protein, crude fibre and chlorophyll. S 13 recorded higher values in total soluble sugars and carbohydrates. K2, the control variety recorded low values with all the varieties in some parameters except for total nitrogen, crude protein crude fibre, chlorophyll (a & b). All the parameters were significantly correlated, except crude fibre and chlorophyll ‘b’, which showed non significant correlation with all. Selection index values were low for V 1 variety that ranked the first followed by S13, S36, MR2, and Anantha.

Leaf feeding quality was studied through bioassay with PM x NB4D2 and CSR2 x CSR4 races, one being a multivoltine x bivoltine cross breed and the other a bivoltine hybrid. Moulting test was conducted with the above said races by feeding the leaves of all varieties to them. Moulting ratio
in I and II moults recorded significant differences between varieties and races. A higher moulting ratio was found in PM x NB4D2 race with S 13 and V 1 followed next. For CSR2 x CSR4 the V 1 variety recorded higher moulting ratio followed by S 13. Single larval weight in the first and the second moults differed significantly between the varieties. The V 1 recorded the highest single larval weight in both the first and the second moults with both PM x NB4D2 and CSR2 x CSR4 races. The control variety K2 recorded higher values over MR2, Anantha, S34, S30 varieties in the first moult with CSR2 x CSR4. In second moult, it showed higher values over S34. In all other conditions, it showed lower values than the other varieties. Based on the selection index values S13 and V1 with low index values were ranked the first, followed by S36 for both PM x NB4D2 and CSR2 x CSR4 races.

To further study the larval growth, full rearing test was conducted in rainy, winter and summer seasons. Mean values over the three seasons were considered. The parameters of the rearing study were larval duration, larval weight, effective rearing rate by number and weight, single cocoon and shell weight, and shell ratio. All the parameters differed significantly between varieties, seasons and varietal and seasonal interaction was found to be significant. A significant positive correlation was found between the yield contributing parameters like larval weight, ERR by weight, single cocoon and shell weight and shell ratio for both the races. The selection index values obtained resulted S 36 variety with low index value ranking the first in bioassay with PM x NB4D2 race. The V 1 variety ranked the first for CSR2 x CSR4 race. The K2 observed higher and lower values compared to other test varieties in the parameters of study.
An attempt was made to select the superior variety based on the overall performance by subjecting to sensitivity analysis through MST software by selecting some important quality and yield contributing parameters with all varieties for both the races. The V 1 was ranked with low index value followed by S13 and S36 varieties for both the races.

Based on the overall performance in propagational, growth & yield, biochemical and bioassay studies V1, S13 and S36 were selected as the best three varieties among all varieties.

To conclude, the objective of the study was to evaluate the superior mulberry variety under semi arid conditions. Perhaps no such change was observed that the high temperature and low humid conditions could alter the yield and yield contributing characters of the mulberry varieties. As because the varieties selected for the study were high yielding and were evaluated in different conditions. However, significant decrease in mulberry leaf yield as well as cocoon yield were observed when compared to other tropical conditions. The present study was an attempt to recommend a superior mulberry variety performing well under semi arid conditions.

The final recommendation emanated from the study is that V 1, S 13 and S 36 mulberry varieties can be successfully utilized under irrigated conditions in the semiarid zones of South India, particularly in Andhra Pradesh for enhancing the cocoon production. Moreover, S 13 variety can be used for chawki rearing along with V 1 garden for late age rearing.