ABSTRACT

The silk is known for its elegance, beauty and durability. By virtue of the economic importance of the silkworm, it is now extensively reared in China and India. The advantage of tropical environment has helped the Indian Sericulture to improve further not only in productivity but also in quality of silk. Concomitant with this there is need for the development of suitable breeds and hybrids to meet the ever growing demand for silk. But stability of the developed breeds at farmer’s level is one of the important factors that need special consideration. As a result the importance of genetical tools in terms of biometrical procedures are very useful to overcome the above problems. Through genetical approach, evaluation of potential breeds/hybrids suitable to different agro climatic regions of our country is of prime importance. In view of the possibility of the identification of promising genotypes through biometrical procedures the research work has been undertaken to utilize the newly evolved breeds of Department of studies in Sericulture Science, University of Mysore to identify superior multi x bi hybrids for commercial exploitation. The rearing and evaluation of the multivoltine breeds MU1, MU11, MU303 and bivoltine breeds MG408, and MU854 along with popular breeds/races have clearly demonstrated the influence of seasons on the performance of the silkworms for the expression of quantitative traits. The biometrical procedures namely inbreeding coefficient, narrow sense heritability and evaluation index which have been applied to assess the quantitative traits in the investigation clearly demonstrated the suitability of the new multivoltines and bivoltine breeds for identification of superior hybrids through line x tester analysis for combining ability and heterosis studies. The novel procedure of studying inbreeding depression in the first chapter through inbreeding coefficient has helped in understanding the level of deterioration of economic traits in the breeds/race. The silkworm breeders can adopt special care to avoid the effects of inbreeding in germplasm stations through this method. The detailed work carried out through three chapters of the thesis on the above lines have helped in the identification of four promising multi x bi hybrids which may be exploited for large scale trials.