PREFACE

_Drosophila_ has been proved to be the best model for genetic studies right from its introduction by T.H. Morgan. Using _Drosophila_, studies have been carried out to understand the pattern of inheritance, variation, speciation and evolution. As a result, enormous knowledge has been accumulated in this field. The knowledge on the nature, extent, the intricacies involved in the differentiation between populations of the same species as well as between closely related species and their phylogenetic relationships has been enriched. Comparative morphology, anatomy, chromosomal variation, hybrid sterility, biochemical aspects, developmental studies have been used to arrive at this conclusion. Of these, behavioural and population genetics is a central discipline in the study of evolution.

In species of the genus _Drosophila_ male do not provide direct benefits i.e. parental care, nuptial gift to mate female but he only transfers sperms and accessory gland secretions to mated female. This secretion has been shown to influence the post mating behaviour and induces physiological changes in the female fly. Therefore species of the genus _Drosophila_ forms a very good model to test the female preference for male traits and male preference for female traits.

Although the genus _Drosophila_ comprises of more than 3000 species. Most of the studies have been carried out employing _D. melanogaster_. However, the other species also form an important source for the studies of
population and evolutionary biology. However, many other species have all potentialities to provide information on population, evolutionary, morphological, biochemical and molecular aspect. Further, most of them have been feebly used or not at all used except their discovery. Thus, present investigation has been undertaken in *D. ananassae* to address the following questions: 1. does females of *D. ananassae* discriminate males on the basis of age, if so, what is its effect on female fitness? 2. Whether or not successful father produce successful son and daughter? 3. Does female mate preference for male age obtain indirect genetic benefits in *D. ananassae*? 4. Whether or not inversion system has influence on inheritance of characters from male to offspring in relation to male age? 5. Does males of *D. ananassae* able to discriminate females on the basis of female age. If so, what is its effect on female fitness? 6. Whether or not inversion system has influence on inheritance of characters from female to offspring in relation to female age?

**Chapter 1** deals with the data on experiments conducted to analyse male age influence on mating success and its effect on male reproductive performance. This chapter also includes the influence of male age on offspring quality.

**Chapter 2** includes the results of experiments conducted to study female age influence on mating success and its effect on female reproductive performance. This chapter also includes the influence of female age on offspring quality.