Infertility and contraception are two sides of the same coin. They are two major issues in the field of reproductive biology that have been a source of immense global concern as each problem by itself poses a very grim situation of tremendous gravity leading to serious repercussions in the society. The work embodied in this thesis therefore deals with these two dynamic aspects of 'infertility' and 'contraception' in the males.

The problem of infertility has long since challenged investigators and clinicians, and often the causes are difficult to identify. 40% of infertility in couples is attributed to the male. While the causes of infertility in women are comparatively well understood and rational treatments are now available, the same cannot be said for men with infertility. The causes of male infertility are often difficult to identify. Chromosomal, hormonal, seminal, immunologic and metabolic factors are known to play a role in male infertility. The importance of semen analysis has been well recognised and in recent years it has focussed on the analysis of sperm concentration, viability, motility characteristics, morphology and biochemical constituents. The use of computer assisted semen analyser (CASA) has greatly enhanced accuracy and speed in semen analysis, in addition to giving details of sperm motion characteristics which were hitherto unknown.

In the present study, therefore specific emphasis was laid in investigating the problem of infertility in the male keeping in mind the newer aspects of its objective assessment. The investigation was aimed at evaluating endocrine factors as well as metabolic alterations associated with the loss of fertility. Semen analysis
was carried out with a view to evaluate the sperm functional ability and thereby determine its possible role as a contributory factor to infertility.

In a socially orthodox society such as ours, infertility poses a social stigma and the male partner is often reluctant to discuss his problems. Therefore, the present study holds special significance in understanding the causes of male infertility and could aid in the diagnosis and management of the patient and enable professional counselling and guidance in such patients.

While the problem of infertility cannot be overlooked though they represent the silent minority in our country, 'population explosion' is one of the major issues of immense global concern which requires immediate attention. Therefore, contraceptive biology has a tremendous role to play. Currently, only half of the world's 800 million couples of reproductive age use family planning methods, but among users only about one third rely on methods involving men. In the last decade however, there has been renewed interest in developing methods for male contraception.

In contrast to the situation with respect to females, where successful oral contraceptive agents are available, investigators are still searching for a satisfactory oral male contraceptive agents. Furthermore, the search for such contraceptive agents has been somewhat bleak as compared to the direct approach in seeking such an agent for the female. The reasons for this are complex but in part relate to the psychology of the male. This attitude has been reflected in the decision making of funding agencies, basic scientists and clinical investigators. Therefore, consciously or unconsciously, much of the past work in the male, until just recently, has been directed primarily to understanding the fundamental control
mechanisms involved in pituitary-hypothalmic-testicular interaction, with little attention to possible means of interfering with these mechanisms.

The quest for a safe, effective and reversible male contraceptive agent continues. The search for new methods has followed several pathways. Four major categories of compounds or agents have been evaluated in the male as positive contraceptives. These include plant extracts, antineoplastic agents, steroidal compounds, and agents that interfere with sperm maturation.

Since time immemorial, plants and plant products have been used as a source of fertility regulating agent. A large number of plants have been tried and tested for their contraceptive efficacy. The present work also deals with the development of a safe, effective, reversible, oral male contraceptive agent from an indogenous source, the papaya seed. The antifertility effects of aqueous extract has been tested earlier in our laboratory and so the present work was carried out to test the potency of benzene and alcoholic extracts of papaya seed as antifertility agents in male rats. The study therefore investigated the effects of the two extracts on the fertility, motility as well as physiology of the reproductive organs. Toxicological studies were also carried out to investigate if the extract possessed side effects, if any. The work also included withdrawal studies of papaya seed extract to investigate reversible effects of papaya seed extract treatments. Therefore the present work is a significant contribution in the search of methods of male contraception in developing countries like India, where population explosion is a ‘monstrous evil’ and the need to curb it is the pressing need of the country.