PREFACE

Settlement and growth of human society and consequential advent of intensive agriculture has prompted evolution of crop pests. It is unlikely that complete eradication of any insect pest will be possible as most of the insects have high reproductive rates and can easily adapt to environmental changes including challenges faced from application of synthetic pesticides. While going through chapters of the book, entitled "Advances in Insect Rearing for Research & Pest Management", edited by Anderson and Leppla (1992), it has come to my knowledge that baseline information on the biology and development of a pest species is needed for planning a successful integrated pest management program. Insect rearing is the craft which can reveal many aspects of biology of a species. Information on biology of a pest species obtained from rearing experiments can be of great importance in future for its management.

In NE India, the foliage crop tea has often got attacked by a guild of defoliators that belong to the lepidopteran family Geometridae. The caterpillars of these moths called 'loopers' have often been a major cause of crop loss, hence require effective management. Control by conventional synthetic pesticides has various drawbacks which include resurgence of pest populations, emergence of secondary pest outbreaks and elimination of beneficial insect species. Alternatively, for production of pure bacterial and viral pesticides or bio agents, large number of disease-free specimens is needed. Such *in vivo* production of bio-pesticides may open up newer approaches of pest management.

In order to obtain information on life-cycle traits and biology of the geometrid pest species of tea, development of their laboratory-based rearing on natural diet and synthetic diet was felt necessary. At the same time, it was realized

that synthetic diet-based rearing would ensure fair supply of disease-free specimen for mass production of microbial bio-pesticides. As no detailed literature, knowledge and data are available on the developmental traits and dietetics of defoliating species of tea infesting geometrid, I contemplated to take up the present study as my Ph.D. work. The financial support for this project came principally from the University Grants Commission, New Delhi (UGC-SAP) and National Tea Research Foundation (NTRF), Tea Board, Kolkata. Receipt of the grants and the fellowship are duly acknowledged with thanks.

My Ph.D. work involved rearing of three geometrid species in laboratory on both natural and synthetic diets through generations, obtaining required data on their biology that included nutritional ecology, development traits and survival under laboratory conditions. *Biston* (=*Buzura*) *suppressaria*, *Hyposidra talaca* and *H. infixaria* were the three common geometrid species found feeding on tea leaves. The principal requirement for healthy growth of all three species were thoroughly studied with standardization of their rearing on synthetic diets that have been formulated for the first-time.

Overall outcome of the present research work will hopefully be able to furnish detailed information on easy identification of each life-stages, nutritional ecology and developmental biology of the said geometrid pests of tea along with state of the art of their in-door rearing through successive generations. I trust that the present contribution will surely open up various opportunities for management of the concerned pest species under the conditions arising from recent restrictions imposed on use of synthetic pesticides (Plant Protection Code 2014 of Tea Board of India) and in adoption of non-conventional bioorganic farming practices.

*Cover page: A tea twig with a 5th instar looper (*Hyposidra talaca*)