PREFACE

Interest in integrated pest management of rice pest has led to an increased awareness of the importance of the utilization of natural enemies and their conservation. The role of indigenous natural enemies as control agents for rice stem borers has been reported by many workers (Yasumatsu, 1964; Rothschild, 1970; Catling, 1979; JICA report, 1981). Requisite informations on the ecology and behaviour of natural enemies are required for their utilization and conservation (Beirne, 1963; Nickel, 1964; Nishida and Wongsiri, 1972; DeBach, 1974; JICA report, 1981). The purpose of this study is to survey and enumerate some of the factors of natural enemies of the rice yellow borer, Scirpophaga incertulas which enable them to survive and be successful as biological control agent. The survival of natural enemies of rice pest can be considered against two backgrounds, rice environment and non-rice area. Further, in general, the environment for natural enemies is favourable during the growth of the rice crop.
in areas where excessive pesticides are not used. However, successful natural enemies must be able to survive the post-harvest conditions. The cropping systems and post-harvest conditions of the paddy fields vary in different parts of West Bengal, India. The cropping system in West Bengal, the area under study, during different periods of the year has been mentioned later.

In general, existing cropping system, appears unfavourable to the natural enemies of rice pests because of the discontinuity of the crop and variation in rainfall. However, according to Yasumatsu (1975a, b, c) and Yasumatsu et al. [1981, JICA Report (1981)], in spite of the hostile environment a rich fauna of natural enemies of rice pests can be found in Thailand. It seems from the observations and the earlier authors that the natural enemies of rice pests of Thailand, being the product of a selective process brought about by the cropping system of great antiquity, are capable of surviving under seemingly hostile environment.

Besides these, in its evolutionary development, the natural enemy fauna of rice pests have never been subjected to such great perturbations in the environment as they are today. Ironically, some of these perturbations are taking place
through necessity under the name of integrated pest management. One of the main perturbations which is gaining importance is pollution by pesticide in the natural enemy environment. In this context one of the objectives of the present integrated pest management programme should be maintenance of a healthy environment so that there will be a free movement of natural enemies into and out of rice growing areas.

The International Biological Programme (IBP) and the integrated pest management (IPM) have made long studies in this respect. The International Association for Biological Control of Rice Stem Borers (IABCR) with the object of exchanging information about the work has been established.

In built integration of the biological and physical components in the pest management contrivances call for indepth knowledge of the natural enemies which play the main role in pest population regulation. Cataloging of the hymenopterous parasites of the yellow rice borer, Scirppophaga incertulas (Walker), a conventional pest of rice in West Bengal, had already been made. The present work tries to provide a comprehensive account of the
hymenopterous natural enemy resources of the yellow rice borer in Part 'I' of the thesis. In Part 'II', an overall attempts have been made to evaluate the effectiveness of the hymenopterous egg parasites of the borer in the paddy rice growing agroecosystems of gangetic alluvium of West Bengal.