## CONTENTS

1. INTRODUCTION 1-7
2. AIM OF THE STUDY 8-9
3. REVIEW OF LITERATURE 10-39
4. MATERIALS AND METHODS 40-59

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Maintainance of insect culture in the laboratory</td>
<td>40</td>
</tr>
<tr>
<td>4.1.1</td>
<td>Culture of lopper caterpillar, <em>Buzura suppressaria</em></td>
<td>40</td>
</tr>
<tr>
<td>4.1.2</td>
<td>Culture of <em>Apanteles taprobanae</em> on lopper caterpillar</td>
<td>40</td>
</tr>
<tr>
<td>4.1.3</td>
<td>Culture of alternate host, <em>Corcyra cephalonica</em></td>
<td>43</td>
</tr>
<tr>
<td>4.1.4</td>
<td>Rearing of <em>A. taprobeone</em> on <em>Corcyra cephalonica</em></td>
<td>43</td>
</tr>
<tr>
<td>4.2</td>
<td>Mating behaviour of parasitoid, <em>Apanteles taprobanae</em></td>
<td>45</td>
</tr>
<tr>
<td>4.3</td>
<td>Population density of <em>Buzura suppressaria</em> and <em>Apanteles taprobanae</em> in the field</td>
<td>45</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Experimental Sites</td>
<td>46</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Observation on the occurrence of Looper caterpillar</td>
<td>46</td>
</tr>
<tr>
<td>4.3.3</td>
<td>Observation on the occurrence of Parasitoid</td>
<td>46</td>
</tr>
<tr>
<td>4.4</td>
<td>Correlation of abiotic factots.</td>
<td>49</td>
</tr>
<tr>
<td>4.5</td>
<td>Field parasitization rate of <em>Apanteles taprobeone</em></td>
<td>49</td>
</tr>
<tr>
<td>4.6</td>
<td>Progeny production and sex ratio of <em>Apanteles taprobanae</em></td>
<td>50</td>
</tr>
<tr>
<td>4.7</td>
<td>Tritrophic relation of parasitoid <em>Apanteles taprobanae</em> and host insect</td>
<td>50</td>
</tr>
<tr>
<td>4.7.1</td>
<td>Construction of T-tube olfactometer</td>
<td>50</td>
</tr>
<tr>
<td>4.7.2</td>
<td>Role of host Frass material in host finding behaviour of parasitoid</td>
<td>52</td>
</tr>
<tr>
<td>4.7.3</td>
<td>Role of host larval body wash in host finding behaviour of parasitoid</td>
<td>52</td>
</tr>
</tbody>
</table>
4.7.4 Response of naïve female to uninfested plant/food material 53

4.8 Spatial distribution pattern of *Apanteles taprobanae* 56

4.8.1 Variance to mean ratio 56

4.8.2 Dispersion parameters of exponent K 56

4.8.3 Co-Efficient of variation 57

4.8.4 Index of mean crowding 57

4.8.5 Lloyds index of patchiness 57

4.8.6 Index of clumping 58

4.8.7 Mean colony size 58

4.8.8 Iwao’s patchiness regression 58

4.8.9 Taylor’s and Powers law 59

5. **RESULTS** 60-108

5.1 Life history of the parasitoid *Apanteles taprobena* 60

5.2 Mating behaviour of *Apanteles taprobanae* 62

5.3 Progeny production and sex ratio 64

5.4 **Tritrophic interactions** 64

5.4.1 Role of host Frass material in host finding

   Behaviour of parasitoid 64

5.4.2. Role of host larval body wash in host finding

   behaviour of parasitoid 64

5.4.3. Role of larval frass in oviposition by parasitoid

   *A. taprobenae* 65

5.4.4 Host stage preference by *Apanteles taprobanae* 68

5.4.5 Response of naïve females to host kairomne 68

5.4.5.1 “T” tube olfactometer test for preference of
infested /uninfested food

5.4.5.2 “T”-tube olfactometer test for host larva preference
5.4.5.3 Rearing of *Apanteles taprobanae* on alternate host, *Corcyra cephalonica*

5.5 Population density of *Buzura suppressaria* and *Apanteles Taprobane* in field during 2006-2007.

5.5.1 Site No. 1 Huloongurie Tea estate
5.5.2 Site no. 2 Dahingeaper Tea estate
5.5.3 Site no. 3 Kotalgoorie Tea Estate

5.6 Spatial distribution pattern of the parasitoid

*Apanteles taprobane*

5.6.1 Hulongorie Tea Estate
5.6.2 Dahingeapar Tea Estates
5.6.3 Kotalgoorie Tea Estates

5.7 Correlation of abiotic factors

5.7.1 Huloongurie Tea estate
5.7.2 Dahingeaper Tea estate
5.7.3 Kotalgoorie Tea Estate

5.8 Field Parasitization rate

6. DISCUSSION

6.1. Biology of parasitoid

6.2 Tritrophic interaction between parasitoid and host

6.3 Population density of looper caterpillar, *B. suppressaria* and its parasitoid, *Apanteles taprobanae* in the field

6.4 Correlation of abiotic factors

6.5 Field parasitization rate

6.6 Spatial distribution pattern of the parasitoid,