Study on the reproductive behavior of *Trichoferus campestris* (Faldermann) (Coleoptera: Cerambycidae)

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Abstract

The habit and reproduction of *Trichoferus campestris* (Faldermann) were observed in one year life-cycle in Zhengzhou (Henan, China), hibernated by larva. The larva likes to feed wood that just fallen from trees, it borers wood in the trunk, makes flat path, and removes excrement in the opening. The adults emerge from the end of May to September, the mating and laying eggs of the majority adults happened in the evening, phototropism, the male and the female are able to fly in a short distance. The male are able to recognize the female in a distance of about 2 - 5 cm. The male and female begin to pursue, embrace, adjust and copulate, but only minority could realize to copulate.

Introduction

*Trichoferus campestris* (Faldermann) is a major pest on stored wood in the North China. Thus larva harm the trees that are week, or that are withering, or that are storming after feeling a tree, and that are bedding materials of goods. A new house that is made of wood, or furniture without paint, harmed more seriously. In 1991, according to reports, *Trichoferus campestris* harmed the grain of corn, and 15 per cent of the percentage of damage. Occurrence of *Trichoferus campestris* and its harm have already been had reported, but study on its reproductive behavior has not yet reported. In order to probe into effective control methods from different angles, authors studied on its reproductive behavior, now the research results are as follows.

Materials and Methods

In 1995, the adults were collected in the wood factory in Zhengzhou, China. In the laboratory we feed withering poplar tree to longicorn beetles. All experiments were conducted at 25 - 32°C in the laboratory made bioassay during July, 1996 and 1997 in Zhengzhou, China. Before the bioassay emerged adults were isolated individually for 20 - 24hs. In each treatment each pair was observed for 72hs in a cage (100cm long, 150cm in diameter), records were kept of male and female behavior during the test period, and continuous replenish the male and female. Treatments of test are shown in Table 1, in each treatment was put into 20 adults, then records behavior reaction.

Results

Habits and characteristics

According to our observation during 1996 and 1997, the adult was seen from April to November. Generally, Lots of adults emerge from May to September. The adult of emergence stays at room of the pupa and without activity, after 3 - 5 days, the adult comes up out of the ground and crawls everywhere, and it does not need replenish nutrition, phototropism, the male and the female are able to fly in a short distance, the mating and laying eggs of the majority of adults happened in the evening, the adult likes to lay eggs on the rough bark that is of withered branch or tree, and on the rough bark that is just feel a tree. Laying eggs is dispersed. The female can lay eggs by an average of 50 in a life, the female of laying eggs will die in 10 - 15 days, the hatching period of eggs is about ten days. The larva bordered wood between phloem and xylem in order to eat, made flat path, and removed encrement in the opening. Until November the larva stopped to activate and began to live through the winter. The life span of an adult was 15 - 20 days.

Come across behavior reaction

There are three conditions about their coming across and behavior reaction of *Trichoferus campestris*:

1. When the male and the other male came across, they were mutually exclusive in many cases, and changed the direction of crawling and went away. In a few cases, the male pursued other male, and crawled onto the back of the body, the percentage of behavior reaction is 30 per cent, but without the reaction of bending a venter and crawling away, sometimes they hit each other by antennae or fought each other, finally the week beetle went away, the other beetle pursued or stayed at same site.
2. When the female and other female came across, they are independent in many cases, without obstruction, slightly hit by antennae, then crawled away. In a few cases, they hit or tore to each other for a few seconds, then went away.

3. When the male and the female came across, they slightly hit each other by antennae, after the male recognized the female, immediately the male pursued the female and crawled onto the back of the body of female. The percentage of reaction was 90 per cent. After crawling the back of the male, adjusted without behavior of bending the venter, then went away. In a few cases, the male pursued the female and crawled onto the back of the body of the female, embraced the female. Occurrence the reaction of bent the venter, but could realize to copulate. only forty per cent (Table 1)

Copulation behavior

Copulation behavior of Trichoteras campestris, majority occurred at 8 - 10 o'clock in the evening, among 20 pairs test beetles. Could realize to copulate only eight pairs. The male crawls while moving the antennae to the side, and hangs its head, the mouth parts constantly get in touch with the ground or with the wood, when the male calssed with the female in a distance of about 3 - 5cm, the male quickly pursued the female, immediately pursued the female and crawled 5cm to the back of the body of female. But when the male and other male came across, the same case occurred as well, these ha've shown that the male and the female could not well recognize. If the sex pheromone in the body of the female or male exists, the studies will be finished in the next few years.

Table 1  The test result of the behavior reaction of Trichoteras campestris

<table>
<thead>
<tr>
<th>Treatment copulate</th>
<th>No</th>
<th>Pairs</th>
<th>Approaching and mounting</th>
<th>Approaching and realize to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>♀ + ♀</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>♂ + ♂</td>
<td>20</td>
<td>6</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>♀ + ♂</td>
<td>20</td>
<td>18</td>
<td>90</td>
<td>8</td>
</tr>
</tbody>
</table>

Discussion

Studies on the copulation behavior of the longhorns beetles. The studies of the predecessors have shown some results. They found that the female was not lively, the behavior proposed, the first the male began (Linsley 1950, wang et al 1990, 1991) Some authors thought some female species have been attracted for the first time by the sex pheromone of the male in a far distance, the female inclined to male, the male has been stimulated by the sex pheromone of female in a short distance and has become lively (Zhang et al 1988, etc) According to facts observed, the male of Trichoteras campestris show behavior proposed the first, in a distance of about 3 - 5 cm after the male recognized the female, quickly crawled, immediately pursued the female and crawled 5 cm to the back of the body of female. But when the male and other male came across, the same case occurred as well, these have shown that the male and the female could not well recognize. If the sex pheromone in the body of the female or male exists, the studies will be finished in the next few years.

References

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