Biology of Some Scolytid Ambrosia Beetles Attacking Tea Plants

IV Parthenogenesis of *Xyleborus germanus* BLAN. in Relation to the *Germanus* Ambrosia Fungus¹

By Takeshi KANEKO and Kazuo TAKAGI
*Tea Research Station, Ministry of Agriculture and
Forestry, Kanaya, Shizuoka Pref.*

Xyleborus germanus BLAN. has social organization of extreme polygamy and its sex ratio is generally about 10:1 (female to male). Although it has been sometimes assumed that non-mating female might produce only male progeny, the whole pattern of parthenogenesis in this beetle remains still obscure.

On the other hand, it is known that the *germanus* fungus is brought into the new breeding areas by the mother beetle (FRANCKE-GROSMANN, 1956), and the beetle seems to survive hardly without this fungus.

In the present study it has been revealed that

the male progeny was produced when the beetle coexisted with the *germanus* fungus. This is a note worthy phenomenon which suggests a new type of parthenogenesis.

The study was conducted from June to July in 1965. As materials *X. germanus* pupae of the 4th generation were collected from the galleries of tea roots under rearing conditions and the male and the female were separately placed in the rearing glass boxes at the room temperature of 23°—25°C. The breeding experiment of the beetle was undertaken as shown in Fig. 1. The newly emerged 10 pairs of adults and non-copulated 10 females were respectively placed in test tubes containing a piece of tea root of 2—3 cm in length, in which ambrosia fungus spores had grown in the galleries. Further, non-copulated 10 pairs of adults were supplied with a piece of fresh tea root without the ambrosia fungus, and another 10 pairs were kept without tea root.

The adult females which fed on the ambrosia fungus and copulated were removed after 4 days.

Thus, all females that went through the above

Table 1. Rate of tea twigs infected with ambrosia fungi

Experimented No.	Number of tea twigs	Number of tea twigs infected with ambrosia fungus	Percentage of twigs infected with ambrosia fungus
1	40	26	65.0%
2	22	16	72.7
3	10	0	0
4	10	0	0

Table 2. *X. germanus* individual female rearing on tea twig
in test tube at 23C° in the 5th generation

Experimented No.	Days after isolation of females	Eggs	Larvae	Pupae		Adults		Average number of individuals per brood
				♀	♂	♀	♂	
1	25 day	5.5	28.5	13.0	1.5	0	0.5	49.0
2	"	0	0	0	7.0	0	0	7.0
3	"	—	—	—	—	—	—	—
4	"	—	—	—	—	—	—	—

1. 茶樹を加害するキクイムシ類の生態 (IV) ハンノキキクイムシの単為生殖とアンブrosia菌のとりこみ。

金子 武・高木一夫 (農林省茶業試験場)

Japanese Journal of Applied Entomology and Zoology, Vol. 9, No. 4, 1965.

(Received for publication, August 6, 1965)

Fig. 1 The procedure of the experiment

procedure were reared on tea twigs in test tubes as reported in previous paper (KANEKO, 1965). The females supplied with the ambrosia fungus were believed to take it into "mycangia" during 4 days and to transmit it to newly provided tea twigs (Table 1).

As clearly shown in Table 2, adult females of *X. germanus* which were provided with the ambrosia fungus have reproductive function. It is interesting that non-copulated females (supplied with the *germanus* fungus) were able to produce male progeny only when they were supplied with

the ambrosia fungus.

REFERENCES

- FRANCKE-GROSMANN, H. (1963) Ann. Rev. Ent. 8:415~438.
 KANEKO, T. (1965) Jap. J. appl. Ent. Zool. 9:211~216.
 KANEKO, T., Y. TAMAKI and K. TAKAGI (1965) Jap. J. appl. Ent. Zool. 9:23~28.
 TAKAGI, K. and T. KANEKO (1965) Jap. J. appl. Ent. Zool. 9:247~248.