CHAPTER 4

Conclusion

I investigated the ant fauna at two coffee plantations, PM and KCK in Chiang Mai province. Distance between the two sites is just 45 km, however ant diversity and the dominant ant species were different between the two coffee plantations. Altitude and vegetation of each plantation might affect the difference. Moreover, we collected the ant colonies at PM, and I observed ant behavior in the presence of CBB under the laboratory condition. As a result, no ant species prey on CBB, but strength of interest in CBB, frequency and time of attack and transportation were different among ant species. While the ant species of large body size showed weak interest to the CBB, small ant such as *Tapinoma* showed a strong interest to CBB. This species showed an aggressive attack against CBB by multiple individuals. Among 121 ant species recorded from two coffee plantations of the present study, 67 ant species had smaller head width than the hole of the CBB. These ants have potential to affect the CBB throughout the year, because they will be able to attack the CBB not only when the CBB is out of the coffee berry, also when the CBB live in the coffee berry. Regardless of the body size, ant species that show aggression against the CBB, can affect the CBB during its dispersal from old berries to new berries. The CBB takes more than one hour to make a hole on a berry. Thus, there may be many possible candidates of ant species for biological control agents of the CBB. Further detailed observations of ant behavior against the CBB will be necessary for evaluating the effectiveness of ants for controlling the important pest insects of coffee.

Of the seven ant species used in this experiment, *Dolichoderus* sp. PM1 seems to be the most effective to the CBB, because the frequency of attacks on CBB was high. In addition, *Technomyrmex yamanei* that was the most dominant in both the rainy and dry season at the PM, is the possible candidate for the biological control agent. Although they did not

show the intensive attacking against the CBB, the frequency of carrying the CBB was high. These genus *Dolichoderus* and *Technomyrmex* have been frequently observed attending the scale insects on the coffee trees. They attack other insects to monopolize the honeydew of scale insects, and it is also possible to drop insects from the coffee trees. This behavior is likely to be indirectly controlling the CBB.

In this experiment, ants belonging to the subfamily Dolichoderinae such as *T.yamanei*, *Dolichoderus* sp. PM1 and *T. indicum* showed high appearance frequency, and showed aggressive behavior toward the CBB. In northern Thailand, at least these study areas, dolichoderine ants seem to the possible biological control agents against the CBB. However, I did observe behaviors only seven ant species, then the significant difference between the species was not observed. One of the possible reasons for the absence of statistical difference may be the small sample size. In the future research, it needs to increase the number of experiments and compare with many more species. It may find other ant species to exert an effect on CBB control. Further, observation of interactions, including the scale insects will be needed. Moreover, the ant fauna were different between PM and KCK. It means ant species as natural enemies of the CBB are different in each coffee plantation. However, the information of ant fauna is poor yet, thus to reveal the ant fauna in more and more areas is the most important for future research.

Anyway, the obtained data of this research will provide a data base of ant species as predator of the CBB and contribute a biological control of coffee pest, also to reduce environmental impact of insecticide in Thailand.

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