



## Report on the current status of Korean jewel beetle, *Chrysochroa coreana* (Coleoptera: Buprestidae)

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### Abstract

The current status of Korean jewel beetle, *Chrysochroa coreana* is reported from the data collected in the five-year field survey (2008-2012). Despite the previous assumption of its endangered status, the beetle was recently found in the south-western part of Korea frequently. However the local population was suffering from the inadequate management of its host plants, *Celtis sinensis* Persson. This study reports the restoration possibility of the beetle by the adequate management of its host plants.

**Key words:** Biodiversity, Buprestidae, *Chrysochroa coreana*, Conservation, Jewel beetle, Korea

### INTRODUCTION

The Korean jewel beetle, *Chrysochroa coreana*, had been admired by Korean for its outstanding beauty. Its beautiful elytra were used in many ways in old Korean artifacts (Kim 1994). However, until recently, the local population of this insect in Korean peninsula was so rare (Kim 1078), so that it is registered as an endangered species by the Ministry of Environment, Korea. In 2008, from the acknowledgement of its cultural value, Korean government also designated this insect as a natural monument (no. 496). According to Nam (2006), *Chrysochroa coreana* is distributed in the Asian region including the Korea, Japan, China, and Taiwan. The recent study (Han et al. 2012) showed that *Chrysochroa coreana* is a mistaken species as *Chrysochroa fulgidissima*.

In the wild, it is rarely possible to find the adults of this beetle in Korea. In this study, the current status of the beetle is reported in relation to its host plant, *Celtis sinensis* Persson.

### MATERIALS AND METHODS

The field survey on the wild population of the beetle was carried out for five years from 2008 to 2012. The south western part of Korean peninsula was the main region of the survey. In each year, a 5-day field survey was performed at each month from June to September when is most likely time for adult emergence of the beetle in Korea. As well as the adult occurrence, the existence of the larvae inside the host plant was examined by carefully splitting the dead stems of *Celtis sinensis*.

During the survey period, visual observation on the host plant was performed as well as its condition as a source food for the beetle. It is known that the larvae of the beetle only consume the dead stems of the host plant. Therefore, the existence of dead stems of the host plant is essential to beetle's survival.

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**Fig. 1.** The dead adult of *Chrysochroa coreana* found inside the decaying wood at the parking lot of Daeheung temple (DT) in Haenam, Korea in 2009.

## HOST PLANT STATUS AND BEETLE POPULATION

The data collected from the survey were analyzed qualitatively on Table 1. Visual observation method was used to identify the existence of the adult beetle at the study site. When the dead corpse of the beetle was sighted, it was photographed and recorded as well. The existence of the larvae was examined by the splitting the dead stems of the host plant randomly at each study site.

As Table 1 shows, the beetles were found at DT and DR sites consistently during the study period. However, the live adults were not observed in 2010 and 2011 at these sites. Most of the host plant observed was long aged trees of more than 100 years old. Meanwhile, the beetles were found live at NT and ST sites in 2010 and 2011. It is not clear whether there is the dispersal of the beetle popula-

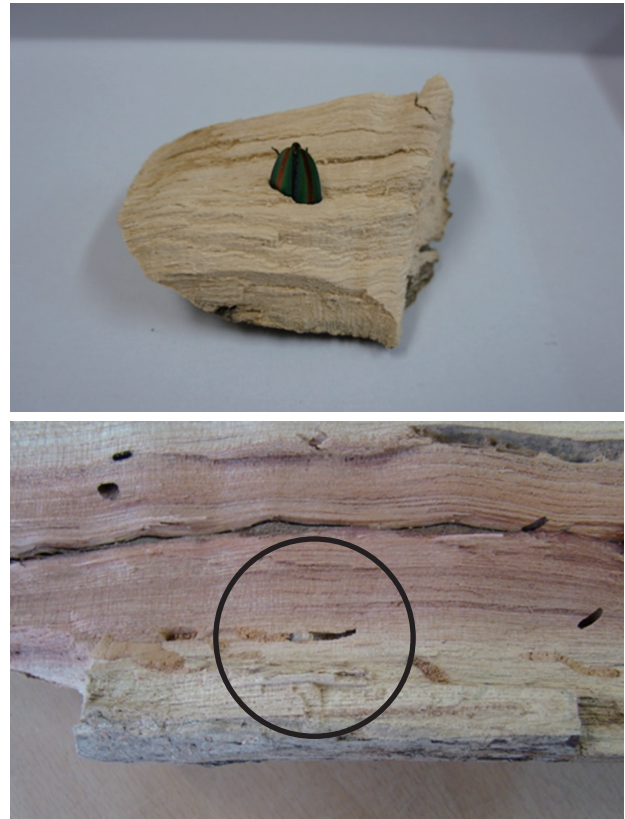


**Fig. 2.** The dead adult of *Chrysochroa coreana* found along the seashore and the larvae found inside the decaying wood in Dangin-Ri (DR), Wando, Korea in 2011.

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**Fig. 3.** The dead adult of *Chrysochroa coreana* found inside the decaying wood among the fire wood stack at the pension lodge near Daeheung temple (DT) in Haenam, Korea in 2011.



**Fig. 4.** The dead adult of *Chrysochroa coreana* and the larvae found inside the dried wood at the wood stack in Naeso Temple (NT), Korea in 2012.

tions among the study sites during this period.

The host plants at the study sites usually suffered from the annual typhoons hitting Korean peninsula, resulting in the production of the broken stems. It is believed to be the main source of the beetle's diet at larval stages. The relationship between the larval density and the quantity of dead stems was significant. DR site where the typhoon damage is most severe, the observation of the larvae was most frequent (Table 1).

Fig. 1 shows the finding of the dead adult beetle inside the dead stem of the host plant at DT site in 2009. Fig. 2 also shows the finding of the dead adult beetle along the seashore at DR site in 2011. At this time, larvae were found inside the broken stems of the host plant by the typhoon. Fig. 3 shows the file-up of the fire wood stack at DT site in 2011. The dead stems of the host plant, *Celtis sinensis*, were found among them. When the dead stem was split carefully, the dead body of the beetle was found. Fig. 4 shows the finding of the dead adult beetle inside the dried stem of the host plant at NT site in 2012. The wood stack

were found at the pension lodge near the entrance of the temple property. At this site, the larvae were also found inside the stem, but they were very small compared to those found from DT and DR sites.

**Table 1.** The occurrence of *Chrysochroa coreana* at each study site during the study period

Study Site	DT	DR	NT	ST
	Daeheung Temple (Haenam)	Dangin-Ri (Wando)	Naeso Temple (Buan)	Seonwun Temple (Gochang)
2008	+ / -	+ / - / *	NA	NA
2009	-	+ / - / *	NA	-
2010	-	+ / - / *	-	NA
2011	- / *	- / *	+ / -	NA
2012	-	- / *	- / *	NA

+ : Live Adult (visual observation)

- : Dead Adult (visual observation)

\* : Larvae inside the host plants

NA: No observation data

## DISCUSSION

From the data collected from the study, the relationship was found between host plant management and the beetle survival. From visual observation, the beetles were best survived at the **DR** sites compared to other sites. The main difference between the two was human interferences on the dealing with the dead stems of the host plant. The old trees of *Celtis sinensis* were found along the shoreline of southern territory in Korea to protect villages from typhoon in the past. The Buddhist temple in Korea also has this tree planted in and around the occupancy. Nowadays, most of these temples were well cared for, and the dead stems of *Celtis sinensis* were removed for the fire wood at these sites. This, in turn, limits the possible food source for *Chrysochroa coreana* in the wild. Many of the dead adults were found inside those woods at the study sites. It is suggested that the detailed study on the beetle survival in relation to the condition of the host plant should be carried out to secure the local population of the beetle in Korea.

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