Paddy Field Environments and Their Adjunct Facilities for Fireflies

OHBA Nobuyoshi

Many paddy fields and the surrounding water systems inhabited by *Luciola cruciata* and *Luciola lateralis* maintain old irrigation systems by utilizing topographic features. Trees grow in the surrounding area, and ridges are maintained by people every year. The existence of these trees is one of the important environmental factors that serve as a resting place for the two species of fireflies mentioned above.

While *Luciola cruciata* and *Luciola owadai* inhabit mainly flowing rivers, *Luciola lateralis* inhabits mainly paddy fields, and aquatic biodiversity is high in such paddy environments.

Fireflies can be effective index organisms for analyzing the environment of paddy fields and their surroundings. In other words, it is possible to know the environmental characteristics of paddy fields and their surroundings accurately by understanding the habits of fireflies that live there, and their luminescent activities. Particularly, *Luciola lateralis* remarkably change their flight luminescent activities and also their luminescent patterns, reflecting the location conditions of paddy fields, the difference in their maintenance conditions, and their abandoned situation.

*Luciola lateralis* inhabit various watersides from rivers to paddy fields, and their habitat density increases in the order of rivers, lakes, swamps, and paddy fields. Paddy fields and their surroundings are maintained artificially, therefore, they are a stable and ideal habitat for *Luciola lateralis* with abundant feeding resources, adapting to their life history. In paddy fields and their surroundings in the intermediate and mountainous area, we can find terrestrial fireflies such as *Luciola parvula* and *Pyrocoelia fumosa*, and also *Lucidina biplagiata*, as well as aquatic fireflies such as *Luciola lateralis* and *Luciola cruciata*. Aquatic fireflies also inhabit paddy fields in China, South Korea, and Taiwan, and various terrestrial fireflies are observed around ridges. This indicates that the waterside environment surrounding paddy fields is suitable also for mating behavior, providing a stable environment with excellent water holding properties and abundant feeding resources.

Key words: Firefly, paddy field, irrigation system, luminescent pattern, intermediate and mountainous area