Survey on Insect Fauna and Role of Insect Gardens for Ecotourism

Youngcheol Choi, Jonggill Kim, Jiyoun Choi, Wontae Kim, Haechul Park, Seokjo Hwang and Gilsang Jeong*
Department of Agricultural Biology, National Academy of Agricultural Science, RDA, Suwon, 441-853, Republic of Korea

ABSTRACT: This study was conducted to investigate insect fauna in the four insect garden sites of Suwon, Yeongyang, Buyeo and Yecheon from 2005 to 2007. Seasonal population size of insects was largest from June to August in all the four sites. In the four sites, Coleopteran insects were dominant followed by Hemiptera and Orthoptera. Unique education/learning programs are successfully run at the insect gardens based on the three geographic types (i.e. urban, mountainous and rural). These activities will help preserve insect biodiversity in the area and visitors better understand life forms such as insects found in the areas.

KEY WORDS: Biodiversity, ecotourism, insect fauna, insect garden, rural development

Major problems in the Korean rural regions are characterized by the decline of farmer populations, forming ageing society, abandoned farmlands, the income imbalance between the urban community and the rural community and poor infrastructure (Choi et al., 2004; Department of Environment, 1997, 1998). To improve the current situations in the rural regions, it is vital to establish appropriate strategies to explore, preserve and improve rural resources and amenities as a value added IT business (OECD, 2002). The sustainable development concept is important in protecting and conserving the environmental resources and at the same time meeting the basic needs of the people (Cho, 1999). Environmental preservation and sustainable development of rural regions

*Corresponding author. E-mail: gilsangj@khu.ac.kr
would therefore be ideal alternatives in enhancing local businesses and welfare of the local people.

Survey on insect fauna was made to better develop the rural areas. The results showed that development of unique insect garden types and education/learning programs suitable to the geographic characteristics of the rural areas would help benefit both farmers and visitors.

**Materials and methods**

**Survey sites**

Four sites in Suwon, Buyeo, Yeongyang and Yecheon were selected to develop several insect garden models taking into consideration of the size and kind of landscapes. These insect gardens keeping their distinct local characteristics were developed and used as education/learning centers.

The insect garden in NAAS (National Academy of Agricultural Science) established in 1997 included bushes, grassland and agricultural spots and four ponds and canals. For species diversity, about 280 species of edible woody plants, bushes, grasses by insects were planted and showcased in the area (Latitude: 37.15.54, Longitude: 126.59.14, altitude: 34m). In addition to the artificial landscape, buildings were built to house and exhibit the various insect collections. Buyeo Bugs Country, on the other hand, had an aquatic insect garden, a Japanese rhinoceros beetle room, and a butterfly and stag beetle observatory (Latitude: 36.18.06, Longitude: 126.50.44, altitude: 68 m). The firefly eco-park in Yeongyang consisted of a firefly observatory, an insect rearing house, and an astronomical observatory (Latitude: 36.50.41, Longitude: 129.16.14, altitude: 351 m). Surveying the vicinity of Yecheon insect gaden started as of 2007 to build an insect garden (Latitude: 36.49.27, Longitude: 128.27.29, altitude: 412 m).

**Data collection**

**Insect fauna**

Insects were surveyed in two representative spots of 25 m² in each of the four areas. The surveys were conducted once a month from May to October from 2005 to 2007. Note that Yecheon area was included in 2007.

Insects were trapped in the cup containing decaying fish and syrup. Fifty cups were set up every 10 m away in each survey area. The cups were collected in the next day morning. Insects were likewise collected from the paddy fields during daytime using insect net. Collected insects were properly identified and certified by specialists of each insect orders.

**Insect community analyses**

**Dominance index**

The dominance of a species is represented by McNaughton’s dominance, DI=(n1+n2)/N, where n1 is the number of individuals of the first dominant species, n2 is the number of individuals of the second dominant species and N is the total number of individuals of all species (McNaughton, 1967).

**Diversity index**

Insect species diversity in a community was determined using the Shannon-Wiever information function,

\[ H' = - \sum_{i=1}^{S} P_i \cdot (\ln P_i), \]

where \( H' \) is diversity index, \( S \) is the total number of species an \( P_i \) the proportion of the number of a species to the total individuals of all species (Pielou, 1969).

**Richness index**

By using Margalef index (1958), species richness was calculated. Richness index is \( RI=(S-1)\ln(N) \), where \( S \) is the total number of species in the community and \( N \) is the total number of individuals in the community.

**Evenness index**

The evenness index was used to determine numerical equality of species in the community. Evenness index is \( E=H'/\ln(S) \), where \( H' \) is derived from Shanon-Wiever information function, \( S \) is the total number of species in the community.