

## Survey of Awareness and Concept of Insects in Korea

Sung-Min Bae, Jae-Bang Choi, Tae-Young Shin, and Soo-Dong Woo\*

*Department of Agricultural Biology, College of Agriculture, Life & Environment Science, Chungbuk National University, Cheongju 361-763, Korea*

### Abstract

To investigate the degree of individuals' concept and awareness of insects, a survey study was conducted with students and adults living in Korea. The misconception rate for insects was about 50% for both students and adults, but it was lower for students and people who had experienced insect-related events than for adults and those who had not. The highest misconception rate was obtained in answer to a question about the basic structure of an insect. Most people had a high awareness of insects. Significant differences and correlations for the awareness of insects were found between students and adults, men and women, people who had experienced insect-related events and those who had not. The experience of an insect-related event most influenced awareness of insects. These results suggest that increasing people's interest in insects and utilizing insects in treatment situations may be beneficial for the field of mental healthcare.

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### Introduction

Insects are among the most diverse groups of animals; the number of existing species is estimated to be between six and ten million (Chapman, 2006; Vojtech *et al.*, 2002). These animals are found in nearly every environment. Humans regard certain insects as pests and attempt to control them using insecticides; however, most insects perform complex ecological roles and provide either direct or indirect economic benefits to humans (Cherniack, 2010; Ratcliffe *et al.*, 2011). Insect pollinators are also essential to the life-cycles of many flowering plant species, upon which most organisms are at least partly dependent (Klein *et al.*, 2007). Recently, the importance of insects as food sources or as pets has increased in many countries, including Korea.

Mental health can be defined as an expression of emotions, or as a state of well-being (Patel and Prince, 2010). There are different types of mental health problems, such as depression and anxiety disorders (Kitchener and Jorm, 2002). Maintaining good mental health is crucial to living a long and healthy life; this has become increasingly clear in recent years (Patel and Prince, 2010). Various therapies have been developed to prevent this problem, including music therapy, art therapy, play therapy, drama therapy, horticultural therapy, and animal-assisted therapy, among others (Marcus, 2013; Söderback *et al.*, 2004; Solanki *et al.*, 2013).

The rearing or observation of insects can provide some humans with good feelings or even affection; therefore, it is possible that insects may be used effectively as a therapeutic tool. In this study, we performed a survey analysis examining

#### \*Corresponding author.

Soo-Dong Woo

Department of Agricultural Biology, College of Agriculture, Life & Environment Science, Chungbuk National University, Cheongju 361-763, Korea.

Tel: +82-43-261-2553 / FAX: +82-43-271-4414

E-mail: [sdwoo@cbnu.ac.kr](mailto:sdwoo@cbnu.ac.kr)

people’s concepts and awareness regarding insects in Korea. These findings may be helpful in developing a therapeutic mental healthcare approach that utilizes insects.

## Materials and Methods

### Survey questions and method

The survey was administered to 788 people, including elementary, middle, and high school students and adults, from May to October 2013. The survey questions were classified into several groups by gender, age, residence, and experience of insect-related events.

### Data analysis

Collected data were converted for coding and analysis with SPSS statistical software (Statistical Product and Service Solutions). Some coding data were also re-coded on an ordinal scale. Frequency, significant difference, and correlation analyses were performed on the coding data using SPSS program version 12.0 (SPSS, Inc., Ctahicago, IL, USA). Significant differences in the nominal and ordinal scales were evaluated by cross-tabulation and *t*-test analysis, respectively.

## Results and Discussion

### Demographic data and concepts of insects

The survey population comprised 788 people, as indicated in Table 1. The component ratio of male to female was approximately 3:4. Students composed about 37% of all survey respondents. The proportion of rural residents was quite low, at about 14%.

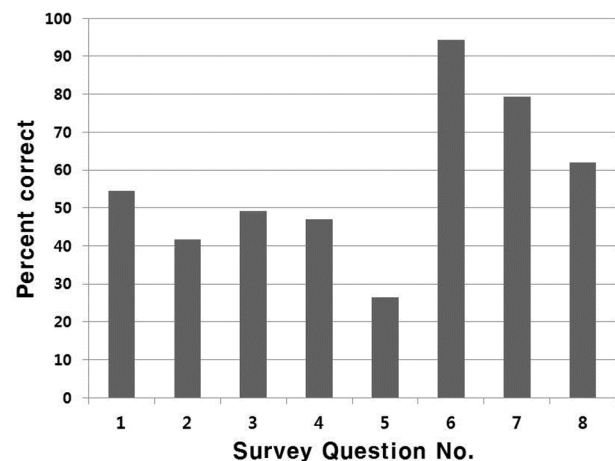
To analyze individuals’ concepts of insects, the survey included eight questions to differentiate insects from other small animals, and to identify the basic characteristics of insects (Table 2). The concept of insects was evaluated by assessing and scoring correct answers for each question. The overall percentage of correct answers was about 57%, but it was highly variable, depending on the question (Fig. 1). The misconception of the basic structure

**Table 1.** Demographic data of survey respondents

Gender	Male	Female
Persons	319	413
Job	Student	Other
Persons	292	496
Residence	Urban	Rural
Persons	663	106
Insect event	Experienced	Non-experienced
Persons	519	269

**Table 2.** Questions for the concept of insects

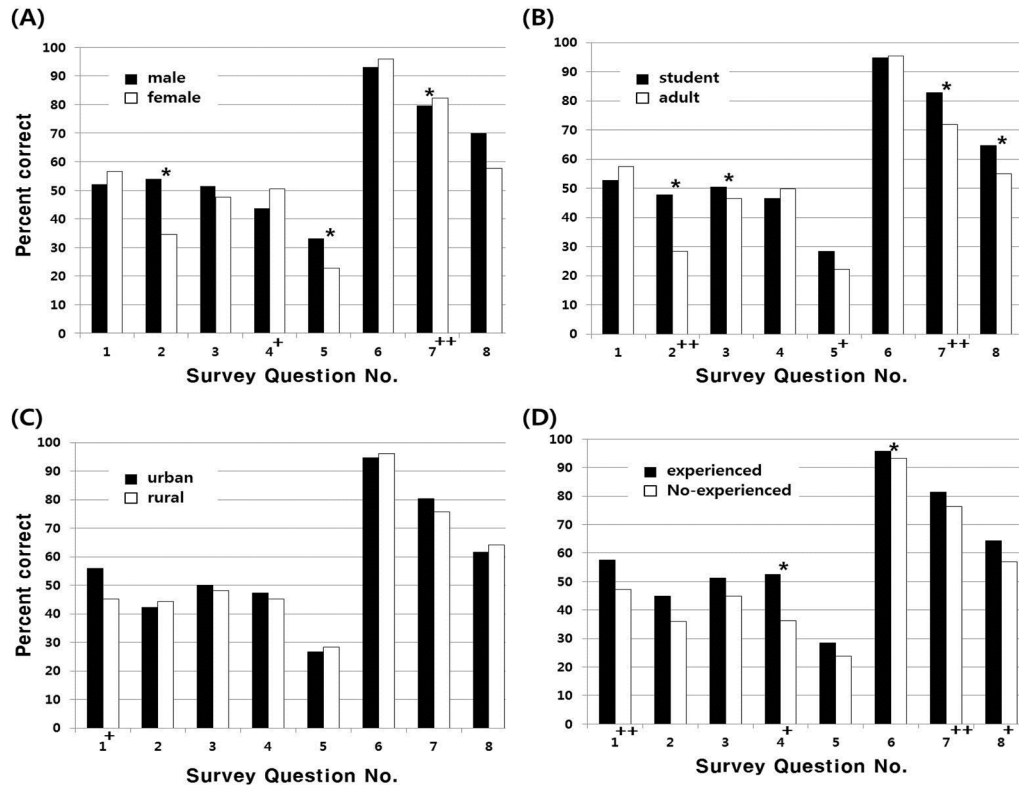
Question	Answer
1. Insects are animals.	Correct
2. Spiders are insects	Incorrect
3. Insects are the same as worms.	Incorrect
4. Ticks are insects.	Incorrect
5. Insects are composed of a head, body, and legs.	Incorrect
6. Insects have genders.	Correct
7. All insects have wings.	Incorrect
8. Insects have brains.	Correct



**Fig. 1.** Overall average percentage of correct answers for the concept of insect.

of insects was especially high.

Additionally, the survey responses indicated low ability (below 50%) to differentiate insects from other small animals. Significant differences and correlations were found between students and adults (Fig. 2B). These differences were also found between



**Fig. 2.** Comparison of the percentage of correct answers between male and female participants (A), students and adults (B), urban and rural residents (C), people experienced with insect-related events and those who were not (D). Significant differences ( $p$  value = .05) and correlation coefficients are marked with asterisks (\*) on the graph and pluses (+) on the number of the question, respectively. For the correlation coefficient, single and double plus signs indicate correlations with values at the 0.05 (+) and 0.01 (++) level, respectively.

people who had experienced insect-related events and those who had not (Fig. 2D). Students and people experienced with insect-related events had a more correct concept of insects than adults and non-experienced people, respectively. These results indicate the importance of continuing education and increased experience with insects. No significant differences were found between gender or residence and insect concept (Fig. 2A and 2C).

**Awareness of insects**

To investigate people’s awareness of insects, the survey included six items concerned with understanding insects (Table 3). The survey responses were rated on a five-point scale that ranged from highly positive to highly negative. For statistical analysis, these answers were re-coded to an ordinal scale: highly positive (5), positive (4), normal (3), negative (2), and highly negative (1). Overall awareness of insects was somewhat high, with an average of 3.1 (Fig. 3). The lowest-scored item was the

**Table 3.** Questions for the awareness of insects

Question
1. I can explain what an insect is.
2. I have many questions about insects.
3. I know the importance of insects in nature and for humans.
4. Insects may be used as a food source for humans.
5. I know a pet insect.
6. I know the dangers of insects.

question concerning participants’ knowledge of the harmfulness of insects. This response suggested that people dislike insects without clear reasons. The significant difference and correlation were found between students and adults, male and female, people experienced in insect-related events and those who were not (Fig. 4A, 4B, 4D).

Students, male participants, and people experienced in insect-related events had higher overall insect awareness. The

experience of insect-related events influenced insect awareness more than did anything else; e.g., residence had no influence on awareness of insects (Fig. 4C). These results indicate that these people may show more effective results when insect therapy

is offered, but also that the tools for insect therapy should be applied according to people's individual differences. These survey results may be useful as basic data in the development of a tool for insect therapy or other insect applications.

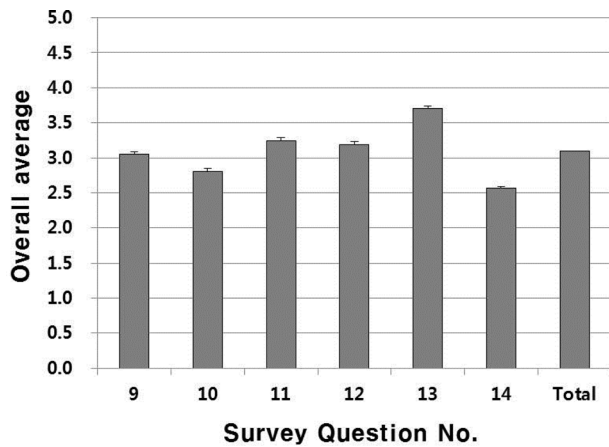


Fig. 3. Overall average awareness of insects.

## Acknowledgements

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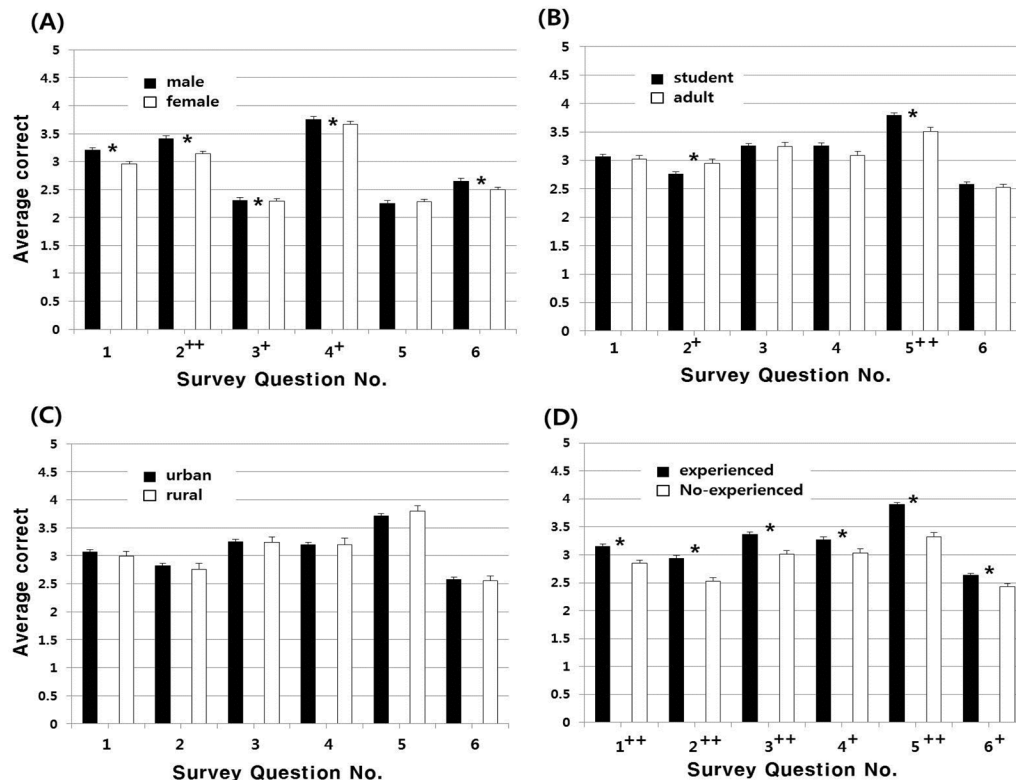


Fig. 4. Comparison of the awareness of insects between male and female participants (A), students and adults (B), urban and rural residents (C), people experienced with insect-related events and those who were not (D). Significant differences ( $p$  value = .05) and correlation coefficients are marked with asterisks (\*) on the graph and pluses (+) on the number of the question, respectively. For the correlation coefficient, single and double plus signs indicate correlations with values at the 0.05 (+) and 0.01 (++) level, respectively. Vertical bars correspond to the standard error.

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