

Insect Fauna of Yeongsil in Mt. Hallasan National Park (excluding Lepidoptera)

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Abstract: As a result of the long-term monitoring of the insect fauna of Yeongsil in Hallasan Mountain National Park, Jeju Island, a total of 146 species belonging to 52 families in 10 orders were identified and enumerated, with the exception of Lepidoptera. In terms of the species observed, 74 Coleoptera species (50.68%) were observed, followed by 17 Hemiptera species (11.70%), 16 Homoptera species (10.95%), 12 Hymenoptera species (8.21%), 11 Orthoptera species (7.53%), 8 Diptera species (5.47%), 5 Odonata species (3.42%), and 1 species each of families Neuroptera, Phasmatodea and Mecoptera (0.68%). The composition of species number of each order was comparative to that of Jeju Island. These results may reflect that the natural environment of Yeongsil area is relatively specific on this island and well conserved.

Keywords: Insect, Yeongsil, Hallasan Mountain National Park

Introduction

Yeongsil, located within the Hallasan Mountain National Park, is included within the administrative district of Jungmun-dong, Seogupo-si. Yeongsil is a part of the Hallasan Mountain National Park, which has been designated as a biosphere reserve and a world heritage site. The region is broadly divided into 4 vegetations of the pine forest, pine and Yeddo hornbeam forest, Yeddo hornbeam and konara oak forest and the Yeddo hornbeam forest. Furthermore, the region exhibits traits which differ from other regions of the Hallasan Mountain National Park, since the region includes a river valley with insects which inhabit areas near water.

Until recently, studies on the insect fauna of Yeongsil were limited to only intermittent and short-term monitoring and reinterpretation of past documents. Therefore, this comprehensive study was conducted in order to monitor the insect fauna of Yeongsil and to compare the data to that of other areas of the Hallasan Mountain National Park, in order to provide basic data for the preservation of insect species and the prediction and evaluation of changes in insect fauna with regards to future climate changes.

Study Method

The study method included outdoor study conducted between 1993 and October of 2011, with focus on the Yeongsil exploration trail (1,000 m above sea level) and the Yeongsil resting time (1,280 m above sea level) (Fig. 1).

Insect nets were used to collect flying insects, such as dragonflies, sweeping method was used in areas of dense tree and shrub population, and insects living on decaying trees and dried leaves were collected after turning over or digging for them. In order to capture nocturnal insects, portable generator (220V mercury lamp) and UV bucket light traps (Bioquip 12V, 18AH, 31.3Cm in diameter,



Fig. 1. Survey area of Yeongsil in Hallasan Mountain National Park.

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height 32Cm) were installed, and the captured moths were collected the next day for specimen preparation and identification. Past records of the study sites and specimen stored in the Folklore & Natural History Museum of Jeju Special Self-governing Province, the Halla Arboretum and the Korea National Arboretum were gathered and organized.

Results and Discussion

Past studies

Past studies on the insect fauna of Yeongsil, with the exception of Lepidoptera, are limited to the *Insects Fauna of Mt. Halla. - Report of the Academic Survey of Hallasan (Mountain) Natural Preserve* by Lee *et al.* (1985), which organized and reported 148 species belonging to 5 orders or 52 families. Therefore, the majority of past studies only include reinterpretation of past studies and short-term studies. In terms of studies on order Odonata, study by Lee (1996) reported 1 species, the *Anax nigrofasciatus* Oguma of family Aeshnidae.

Studies on order Orthoptera included study by Huh and Kwon (1995a, 1995b), which reported 1 species of the *Tetrix japonica* I. Bolivar of family Tetrigidae, study by Jung (2001), which reported 5 species, including the *Gryllotalpa orientalis* Burmeister of family Gryllotalpidae, and the study by Kim (2007), which reported 6 species, including the *Glyptothorax tamna* Kim of family Acrididae.

Studies on order Hemiptera included study by Lee *et al.* (1985), which reported 9 species of 7 families, and study by Kim (1995), which reported 8 species of 4 families, including the *Nabis apicalis* Matsumura of family Nabidae.

Studies on order Homoptera included study by Lee *et al.* (1985), which recorded 7 species of 5 families, and study by Huh and Kwon (1995b), which recorded 9 species of 3 families, including the *Eoscartopsis assimilis* Uhler, 1896 of family Cercopidae.

Studies on order Coleoptera included study by Lee *et al.* (1985), which recorded 17 species of 8 families, and study by Park and Kwon (1995), which recorded 2 species, including the *Damaster smaragdinus* Von Waldheim Fischer of family Carabidae. Studies on order Harpalidae included study by Paik (1995), which recorded 2 species, including the *Harpalus aenigma* Tschitscherine, study by Park and Paik (2001), which recorded 2 species, including the *Harpalus roninus* Bates, and study by Paik and Moon (2005), which recorded 1 species, including the *Harpalus aenigma* Tschitscherine. Studies on order Dytiscidae included study by Jung (2001), which recorded 1 species, including the *Agabus optatus* Sharp and study by Jung (2006), which recorded 2 species, including the *Agabus miyamotoi* Nakane. Studies on order Erotylidae included study by Choi and Woo (1995), which recorded 4 species, including the *Aulacochilus decoratus* Reitter. Studies on order Chrysomelidae included study by An and Kwon (1995), which recorded 7 species, including the *Altica cirsiicola* Ohno. Studies on order Curculionidae included study by Hong, J., A. B. Egorov and B. A. Korotyaev (2000), which recorded 10 species, including the *Acicnemis suturalis* Roelofs.

Studies on order Diptera included study by Lee *et al.* (1985), which recorded 6 species belonging to 4 families, and study by Suh and Kwon (1995), which recorded 1 species of the *Campiglossa hirayamae* Matsumura of family Tephritidae.

Discussion

The result of monitoring the insect fauna with the exception of Lepidoptera identified a total of 146 species belonging to 52 families in 10 orders (Table 1). In terms of the species observed, 74 Coleoptera species (50.68%) were observed, followed by 17 Hemiptera species (11.70%), 16 Homoptera species (10.95%), 12 Hymenoptera species (8.21%), 11

Table 1. The total number of insect and relative dominance in of Yeongsil in Hallasan Mountain National Park

Order	Family	Species	Ratio (%)	Endemic Species* (ESK)	Management of Exotic Species (MES)	Designated Species** (DS)
Odonata	3	5	3.42			
Orthoptera	3	11	7.53	6		
Phasmatodea	1	1	0.68	1		1
Hemiptera	9	17	11.70			
Homoptera	6	16	10.95	1		
Neuroptera	1	1	0.68			
Coleoptera	18	74	50.68	1	4	11
Hymenoptera	6	12	8.21			1
Mecoptera	1	1	0.68			
Diptera	4	8	5.47			3
11 orders	52	146	100	9	4	16

*Endemic Species: NIBR, 2011

**Designated Species: ME and NIER, 2006

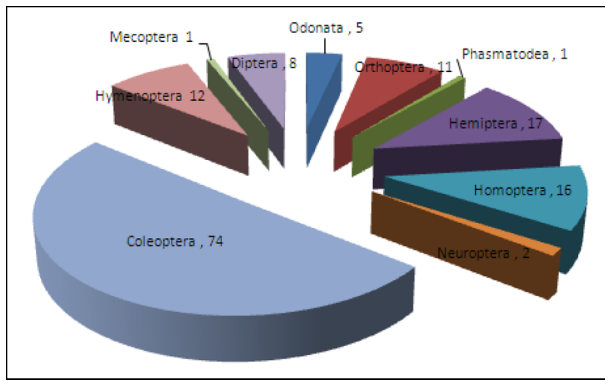


Fig. 2. Taxonomic group composition of the insect at Yeongsil in Hallasan Mountain National Park.



Fig. 3. *Megaulacobothrus jejuensis* Kim, 2007.



Fig. 4. *Omocestus haemorrhoidalis* (Charpentier, 1825).



Fig. 5. *Prumna halrasana* (Lee et Lee, 1984).

Orthoptera species (7.53%), 8 Diptera species (5.47%), 5 Odonata species (3.42%), and 1 species each of families Neuroptera, Phasmatodea and Mecoptera (0.68%) (Table 1, Fig. 2).

A total of 9 indigenous species of Korea belonging to 4 orders and 6 families (Table 2), including the *Megaulacobothrus jejuensis* Kim (Fig. 3), *Omocestus haemorrhoidalis* Charpentier and the *Prumna halrasana* Lee et Lee (Fig. 5), were observed during the study.

A total of 4 species belonging to 1 family and 1 order,

including the *Damaster smaragdinus* Von Waldheim Fischer (Fig. 6) of family Carabidae, order Coleoptera, were identified as species legally protected from export.

In the case of Designated Species, a total of 16 species belonging to 6 families and 4 orders, including the *Nicrophorus concolor* Kraatz of family Silphidae, order Coleoptera were identified (Fig. 7).

The *Glyptobothrus tamna* Kim of family Acrididae and order Orthoptera was found as the 1 species native to Jeju Island. In terms of species which are found abroad but only in Jeju Island in South Korea, a total of 4 species belonging

Table 2. List of legally protected insects collection of Yeongsil in Hallasan Mountain National Park

Classification	Species
Endemic Species* (ESK)	땅강아지 [<i>Gryllotalpa orientalis</i> Burmeister, 1839], 모메뚜기 [<i>Tetrix japonica</i> (I. Bolivar, 1887)], 청날개애메뚜기 [<i>Megaulacobothrus jejuensis</i> Kim, 2007], 삽사리 [<i>Mongolotettix japonicus japonicus</i> (I. Bolivar, 1898)], 대륙메뚜기 [<i>Omocestus haemorrhoidalis</i> (Charpentier, 1825)], 한라북방밀들이메뚜기 [<i>Prumna halrasana</i> (Lee et Lee, 1984)], 대벌레 [<i>Baculum elongatum</i> (Thunberg, 1815)], 거제도황백매미충 [<i>Pagaronia geojeodoensis</i> Kwon et Lee, 1980], 제주그물눈풍뎅이 [<i>Holotrichia reticulata</i> Murayama, 1941]
Management of Exotic Species (MES)	멋쟁이딱정벌레 [<i>Damaster jankowskii</i> Oberthur, 1885], 홍단딱정벌레 [<i>Damaster smaragdinus</i> Von Waldheim Fischer, 1824], 우리딱정벌레 [<i>Carabus sternbergi</i> Roeschke, 1898], 왕딱정벌레 [<i>Carabus fiduciarius</i> Thomson, 1865]
Designated Species** (DS)	대벌레 [<i>Baculum elongatum</i> (Thunberg, 1815)], 검정송장벌레 [<i>Nicrophorus concolor</i> Kraatz, 1877], 송장벌레 [<i>Nicrophorus japonicus</i> Harold, 1877], 넉점박이송장벌레 [<i>Nicrophorus quadripunctatus</i> Kraatz, 1877], 큰수중다리송장벌레 [<i>Necrodes asiaticus</i> Portevin, 1922], 큰넓적송장벌레 [<i>Eusilpha jakowlewii</i> (Semenov, 1891)], 열흰점박이무당벌레 [<i>Clavia decemguttata</i> (Linnaeus, 1767)], 칠성무당벌레 [<i>Coccinella septempunctata</i> Linnaeus, 1758], 무당벌레 [<i>Harmonia axyridis</i> (Pallas, 1773)], 십이흰점무당벌레 [<i>Vibidia duodecimguttata</i> (Poda, 1761)], 금록색잎벌레 [<i>Basilepta fulvipes</i> (Motschulsky, 1860)], 상아잎벌레 [<i>Gallerucida bifasciata</i> Motschulsky, 1860], 홍배꼬마꽃벌 [<i>Sphecodes similimus</i> Smith, 1873], 광꽃등애 [<i>Melanostoma scalare</i> (Fabricius, 1794)], 꽃등애 [<i>Eristalis tenax</i> (Linnaeus, 1758)], 수중다리꽃등애 [<i>Helophilus virgatus</i> Coquillett, 1898]



Fig. 6. *Damaster smaragdinus* Von Waldheim Fischer, 1824.



Fig. 7. *Nicrophorus concolor* Kraatz, 1877.

to 4 families and 3 orders were found, including the *Rhantus yessoensis* Sharp of family Dytiscidae and order Dytiscidae, the *Aphthona perminuta* Baly of family Chrysomelidae, the *Camponotus obscuripes* Mayr of family Formicidae and order Hymenoptera, and the *Panorpa approximata* Esben-Petersen of family Panorpidae and order Mecoptera.

Study by Jung and Kim (2000) on the insect fauna of regions outside of the Hallasan Mountain National Park recorded 379 species belonging to 100 families and 14 orders. The results of this study on the insect fauna of Yeongsil recorded a total of 146 species belonging to 52 families in 10 orders, which is only approximately 39% of the aforementioned study, and this result is influenced by the region's vegetation and the number of study sessions. In other words, while Gwaneumsa temple is composed primarily of deciduous broad-leaved trees, such as the konara oak and the sargent cherry, open farm fields and wild weeds, Yeongsil is composed primarily of woody plants, such as the Konara oak, Yeddo hornbeam and the pine, and the lower vegetation species of the *Sasa guelpaertensis* Nakai, which is predicted to have been the cause of the region's low insect diversity. Besides the Hallasan Mountain National Park, other national parts of other regions are also displaying decreasing insect diversity, with increasing

coverage of lower vegetation with *Sasa borealis* Makino. In the future, *Sasa borealis* Makino must be removed to allow increased level of lower vegetation, in order to increase insect species diversity.

Since the Yeongsil has received protection, following its designation as a biosphere reserve and a world heritage site, it can be said that the region plays a significant role in ecological preservation. Therefore, the insect species composition of the forest ecosystem of this region has a close relationship with its flora and vegetation. Accordingly, judging from the insect species and species composition observed from this study, it is expected that continuous studies with a more diverse collection methods will result in additional species observed. The results of this study are predicted to be used as valuable data for the prediction of the changes in the insect fauna of Yeongsil with future climate changes.

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Appendix. Insect Fauna of Yeongsil in Mt. Hallasan National Park (exclusion of Lepidoptera)

The classification was followed by the Checklist of Koeran Insects (2010) and species were organized alphabetically. Mark ‘*’ indicates native species, mark ‘**’ indicates species native to Jeju Island, and the mark ‘?’ indicates unidentified species.

Order 1. Odonata 잠자리목

Family 1. Coenagrionidae 실잠자리과

- | | |
|--|--------|
| 1. <i>Ceriagrion melanurum</i> (Selys, 1876) | 노란실잠자리 |
|--|--------|

Family 2. Aeshnidae 왕잠자리과

- | | |
|---|--------|
| 1. <i>Anax nigrofasciatus</i> Oguma, 1915 | 먹줄왕잠자리 |
|---|--------|

Family 3. Libellulidae 잠자리과

- | | |
|--|----------|
| 1. <i>Orthetrum melania</i> Selys, 1883 | 큰밀잠자리 |
| 2. <i>Pantala flavescens</i> (Fabricius, 1798) | 된장잠자리 |
| 3. <i>Sympetrum eroticum</i> (Selys, 1883) | 두점박이줄잠자리 |

Order 2. Orthoptera 메뚜기목

Family 1. Gryllotalpidae 땅강아지과

- | | |
|---|------|
| 1. <i>Gryllotalpa orientalis</i> Burmeister, 1839 * | 땅강아지 |
|---|------|

Family 2. Tettigidae 모메뚜기과

- | | |
|--|------|
| 1. <i>Tetrix japonica</i> (I. Bolivar, 1887) | 모메뚜기 |
|--|------|

Family 3. Acrididae 메뚜기과

- | | |
|--|------------|
| 1. <i>Chorthippus biguttulus maritimus</i> Mistshenko, 1951 | 애메뚜기 |
| 2. <i>Glyptobothrus tamna</i> Kim, 2007 ** | 탐라애메뚜기 |
| 3. <i>Megaulacobothrus jejuensis</i> Kim, 2007 *, ** | 청날개애메뚜기 |
| 4. <i>Megaulacobothrus latipennis</i> (I. Bolivar, 1898) | 폭날개애메뚜기 |
| 5. <i>Mongolotettix japonicus japonicus</i> (I. Bolivar, 1898) * | 삼사리 |
| 6. <i>Mongolotettix japonicus vittatus</i> (Uvarov, 1914) | |
| 7. <i>Omocestus haemorrhoidalis</i> (Charpentier, 1825) * | 대륙메뚜기 |
| 8. <i>Parapodisma setouchiensis</i> Inoue, 1979 | 밀들이메뚜기 |
| 9. <i>Prumna halrasana</i> (Lee et Lee, 1984) * | 한라북방밀들이메뚜기 |

Order 3. Phasmatodea 대벌레목

Family 1. Phasmatidae (Phasmidae)

- | | |
|--|-------------|
| 1. <i>Baculum elongatum</i> (Thunberg, 1815) * | 대벌레과
대벌레 |
|--|-------------|

Order 4. Hemiptera 노린재목

Family 1. Gerridae 소금쟁이과

- | | |
|---|---------|
| 1. <i>Gerris gracilicornis</i> (Horvth, 1879) | 등빨강소금쟁이 |
|---|---------|

Family 2. Nabidae 췌기노린재과

- | | |
|--|------------|
| 1. <i>Himacerus apterus</i> (Fabricius, 1798) | 미니날개큰췌기노린재 |
| 2. <i>Nabis apicalis</i> Matsumura, 1913 | 미니날개애췌기노린재 |
| 3. <i>Prostemma hilgendorffi</i> Miyamoto et Lee, 1966 | 알락날개췌기노린재 |

Family 3. Miridae 장님노린재과

- | | |
|--|-----------|
| 1. <i>Adelphocoris triannulatus</i> (Stål, 1858) | 설상무늬장님노린재 |
| 2. <i>Creontiades coloripes</i> Hsiao, 1963 | 날개홍선장님노린재 |
| 3. <i>Lygocoris nigrifolius</i> (Linnæus, 1758) | 검은빛장님노린재 |
| 4. <i>Psallus tonnaichanus</i> Muramoto, 1973 | 해동우리장님노린재 |

Family 4. Lygaeidae 긴노린재과

- 1.
- Neolethaeus dallasi*
- (Scott, 1880)

달라시긴노린재

Family 5. Largidae 큰별노린재과

- 1.
- Physopelta cincticollis*
- Stål, 1863

여수별노린재

Family 6. Rhopalidae 잡초노린재과

- 1.
- Rhopalus sapporensis*
- (Matusumura, 1905)
-
- 2.
- Stictopleurus crassicornis*
- (Linnaeus, 1758)

삿포로잡초노린재
흑다리잡초노린재

Family 7. Urostylidae 참나무노린재과

- 1.
- Urostylis annulicornis*
- Scott, 1874

작은주걱참나무노린재

Family 8. Acanthosomatidae 뿔노린재과

- 1.
- Acanthosoma labiduroides*
- Jakovlev, 1880
-
- 2.
- Dichobothrium nubilum*
- Dallas, 1851
-
- 3.
- Elasmotethus humeralis*
- Jakovlev, 1883

긴가위뿔노린재
남방뿔노린재
얼룩뿔노린재

Family 9. Pentatomidae 노린재과

- 1.
- Carbula putoni*
- (Jakovlev, 1876)

가시노린재

Order 5. Homoptera 매미목

Family 1. Cercopidae 쥐머리거품벌레과

- 1.
- Eoscartopsis assimilis*
- (Uhler, 1896)

쥐머리거품벌레

Family 2. Aphrophoridae 거품벌레과

- 1.
- Aphrophora flavipes*
- Uhler, 1896
-
- 2.
- Aphrophora intermedia*
- Uhler, 1896

솔거품벌레
흰띠거품벌레

Family 3. Cicadellidae 매미충과

- 1.
- Bothrogonia japonica*
- Ishihara, 1962
-
- 2.
- Evacanthus interruptus*
- (Linnaeus, 1758)
-
- 3.
- Ledra auditura*
- Walker, 1858
-
- 4.
- Macrosteles brunnescens*
- Anufriev, 1968
-
- 5.
- Macrosteles striifrons*
- Anufriev, 1968
-
- 6.
- Nephotettix cincticeps*
- (Uhler, 1896)
-
- 7.
- Pagaronia geojedoensis*
- Kwon et Lee, 1980 *
-
- 8.
- Planaphrodes nigricans*
- (Matsumura, 1912)
-
- 9.
- Stroggylocephalus agrestis*
- (Fallén, 1806)
-
- 10.
- Yanocephalus yanonis*
- (Matsumura, 1902)

끝검은말매미충
날개무늬관매미충
귀매미
꼬마매미충
꼭지매미충
끝둥매미충
거제도황백매미충
흑곰매미충
벼넓적매미충
야노뽕족매미충

Family 4. Issidae 알멸구과

- 1.
- Gergithus variabilis*
- (Butler, 1875)

홍도알멸구

Family 5. Cixiidae 장삼벌레과

- 1.
- Andes harimaensis*
- (Matsumura, 1914)

모시장삼벌레

Family 6. Cicadidae 매미과

- 1.
- Platypleura kaempferi*
- (Fabricius, 1794)

털매미

Order 6. Neuroptera 풀잠자리목

Family 1. Osmylidae 보날개풀잠자리과

1. *Lysmus harmandinus* (Navas, 1910) 보날개풀잠자리

Order 7. Coleoptera 딱정벌레목

Family 1. Carabidae 딱정벌레과

1. *Carabus fiduciarius* Thomson, 1865 왕딱정벌레
 2. *Carabus sternbergi* Roeschke, 1898 우리딱정벌레
 3. *Damaster jankowskii* Oberthur, 1885 멧쟁이딱정벌레
 4. *Damaster smaragdinus* Von Waldheim Fischer, 1824 흥단딱정벌레
 5. *Hemicarabus tuberculosus* Dejean et Boisduval, 1829 애딱정벌레

Family 2. Harpalidae 먼지벌레과

1. *Colpodes buchanani* Hope, 1831 날개끝가시먼지벌레
 2. *Colpodes japonicus* (Motschulsky, 1860) 일본줄납작먼지벌레
 3. *Harpalus aenigma* (Tschitscherine, 1897) 청둥머리먼지벌레
 4. *Harpalus roninus* Bates, 1873 설악머리먼지벌레
 5. *Lebia retrofasciata* Motschulsky, 1864 한라십자무늬먼지벌레
 6. *Leistus niger* Gebler, 1847 애가슴먼지벌레
 7. *Platynus magnus* (Bates, 1873) 큰납작먼지벌레

Family 3. Dytiscidae 물방개과

1. *Agabus miyamotoi* (Nakane, 1959) 땅콩물방개
 2. *Agabus optatus* Sharp, 1884 검정땅콩물방개
 3. *Rhantus pulverosus* (Stephens, 1828) 애기물방개
 4. *Rhantus yessoensis* Sharp, 1891 제주애기물방개

Family 4. Histeridae 풍뎡이붙이과

1. *Margarinotus niponicus* (Lewis, 1895) 쯔뎡이붙이

Family 5. Silphidae 송장벌레과

1. *Eusilpha jakowlewi* (Semenow, 1891) 큰넓적송장벌레
 2. *Necrodes asiaticus* Portevin, 1922 큰수중다리송장벌레
 3. *Nicrophorus concolor* Kraatz, 1877 검정송장벌레
 4. *Nicrophorus japonicus* Harold, 1877 송장벌레
 5. *Nicrophorus quadripunctatus* Kraatz, 1877 녀점박이송장벌레
 6. *Silpha perforata* Gebler, 1832 넓적송장벌레

Family 6. Trogidae 송장풍뎡이과

1. *Trogus setifer* Waterhouse, 1875 송장풍뎡이

Family 7. Melolonthidae 검정풍뎡이과

1. *Ectinohoplia rufipes* (Motschulsky, 1860) 주황긴다리풍뎡이
 2. *Heptophylla picea* Motschulsky, 1857 긴다색풍뎡이
 3. *Holotrichia diomphalia* (Bates, 1888) 참검정풍뎡이
 4. *Holotrichia reticulata* Murayama, 1941 * 제주그물눈검정풍뎡이
 5. *Maladera japonica* (Motschulsky, 1860) 우단풍뎡이
 6. *Maladera verticalis* (Fairmaire, 1888) 빨간색우단풍뎡이
 7. *Sericania yamauchii* Sawada, 1938 하세가와다색우단풍뎡이

Family 8. Scarabaeidae 풍뎡이과

1. *Miridiva koreana* Nijima et Kinoshita, 1923 고려노랑풍뎡이
 2. *Popillia mutans* Newmann, 1838 쿡풍뎡이
 3. *Spilota plagicollis* Fairmaire, 1866 등노랑풍뎡이

Family 9. Elateridae 방아벌레과

1. *Melanotus erythropygus* Candze, 1860

큰빨간빛살방아벌레

Family 10. Cantharidae 병대벌레과

1. *Athemus vittelinus* (Kiesenwetter, 1874)
2. *Podabrus lictorius* Lewis, 1895

회황색병대벌레

포줄병대벌레

Family 11. Nitidulidae 밀빠진벌레(나무밀쑤시기)과

1. *Soronia fracta* Reitter, 1873

큰납작밀빠진벌레

Family 12. Erotylidae 버섯벌레과

1. *Aulacochilus decoratus* Reitter, 1879
2. *Dacne picta* Crotch, 1873
3. *Episcapha flavofasciata* (Reitter, 1879)
4. *Episcapha gorhami* Lewis, 1879
5. *Tetratriplax inornata* (Chj, 1941)

툽나무버섯벌레

노랑테가버섯벌레

노랑줄왕버섯벌레

고오람왕버섯벌레

제주붉은줄버섯벌레

Family 13. Coccinellidae 무당벌레과

1. *Clavia decemguttata* (Linnaeus, 1767)
2. *Coccinella septempunctata* Linnaeus, 1758
3. *Harmonia axyridis* (Pallas, 1773)
4. *Vibidia duodecimguttata* (Poda, 1761)

열흰점박이무당벌레

칠성무당벌레

무당벌레

십이흰점무당벌레

Family 14. Oedemeridae 하늘소붙이(어리하늘소)과

1. *Chrysanthia viatica* Lewis, 1895
2. *Oedemerina subrobusta* Nakane, 1954

줄진하늘소붙이

주름살하늘소붙이

Family 15. Cerambycidae 하늘소과

1. *Cephalallus unicolor* Gahan, 1906
2. *Distenia gracilis* (Blessig, 1872)
3. *Monochamus subfasciatus* (Bates, 1873)
4. *Saperda octomaculata* Blessig, 1873
5. *Spondylis buprestoides* (Linnaeus, 1758)

넓적하늘소

갈따구하늘소

긴수염하늘소

팔점긴하늘소

검정하늘소

Family 16. Chrysomelidae 잎벌레과

1. *Altica cirsiicola* Ohno, 1960
2. *Aphthona perminuta* Baly, 1875
3. *Basilepta fulvipes* (Motschulsky, 1860)
4. *Cryptocephalus exiguus* Schneider, 1792
5. *Galeruca vicina* Solsky, 1872
6. *Gallerucida bifasciata* Motschulsky, 1860
7. *Hemipyxis plagioderoides* (Motschulsky, 1860)
8. *Scelodonta lewisii* Baly, 1874
9. *Stenoluperus nipponensis* (Laboissiere, 1913)

영강퀴벼룩잎벌레

검정배애벼룩잎벌레

금록색잎벌레

닭은꼬마통잎벌레

한서잎벌레

상아잎벌레

보라색잎벌레

이마줄뿔추잎벌레

섬나라잎벌레

Family 17. Curculionidae 바구미과

1. *Acicnemis suturalis* Roelofs, 1875
2. *Anthonomus rectirostris* (Linnaeus, 1758)
3. *Calomycterus setarius* Roelofs, 1873
4. *Curculio flavoscutellatus* Roelofs, 1874
5. *Cyrtopistomus castaneus* (Roelofs, 1873)
6. *Eugnathus distinctus* Roelofs, 1873
7. *Morimotozo obscurus* Roelofs, 1873

등고목바구미

꽃바구미

털줄바구미

보리수뿔바구미

밤색주둥이바구미

쌍무늬바구미

가죽긴알바구미

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| 8. <i>Nespilobaris parabasimaculatus</i> (Morimoto et Lee, 1992) | 맵시아바구미 |
| 9. <i>Orchestes japonicus</i> Hustache, 1920 | 떡갈나무벼룩바구미 |
| 10. <i>Pseudocneorhinus setosus</i> Roelofs, 1879 | 가시털바구미 |

Family 18. Rhynchophoridae 왕바구미과

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|---|----------|
| 1. <i>Sitophilus granarius</i> (Linnaeus, 1758) | 그라나리아바구미 |
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Order 8. Hymenoptera 벌목

Family 1. Tenthredinidae 잎벌과

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|---|--------|
| 1. <i>Athalia japonica</i> (Klug, 1813) | 왜무잎벌 |
| 2. <i>Rhogogaster varipes</i> (Kirby, 1882) | 북방상제잎벌 |

Family 2. Ichneumonidae 맵시벌과

- | | |
|---|-----------|
| 1. <i>Ephialtes capulifera</i> (Kriechbaumer, 1874) | 황다리납작맵시벌 |
| 2. <i>Netelia tarsata</i> (Brischke, 1880) | 꼬리아자루맵시벌 |
| 3. <i>Netelia virgatus</i> (Fourcroy, 1785) | 등검정자루맵시벌 |
| 4. <i>Ophion luteus</i> (Linnaeus, 1758) | 왕자루맵시벌 |
| 5. <i>Schizoloma amictum</i> (Fabricius, 1775) | 어리곤봉자루맵시벌 |

Family 3. Formicidae 개미과

- | | |
|--|-------|
| 1. <i>Camponotus japonicus</i> Mayr, 1866 | 일본왕개미 |
| 2. <i>Camponotus obscuripes</i> Mayr, 1871 | 홍가슴개미 |

Family 4. Vespidae 말벌과

- | | |
|---|-----|
| 1. <i>Vespa simillima xanthoptera</i> Cameron, 1903 | 황말벌 |
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Family 5. Halictidae 꼬마꽃벌과

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|--|--------|
| 1. <i>Sphecodes simillimus</i> Smith, 1873 | 홍배꼬마꽃벌 |
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Family 6. Apidae 꿀벌과

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|-------------------------------------|------|
| 1. <i>Bombus ardens</i> Smith, 1879 | 센뒤영벌 |
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Order 9. Mecoptera 밀드리목

Family 1. Panorpidae 밀드리과

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|--|-------|
| 1. <i>Panorpa approximata</i> Esben-Petersen, 1915 | 제주밀드리 |
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Order 10. Diptera 파리목

Family 1. Tipulidae 각다귀과

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|--|---------|
| 1. <i>Tipula aino</i> Alexander, 1914 | 아이노각다귀 |
| 2. <i>Tipula flavocostalis</i> Alexander, 1921 | |
| 3. <i>Tipula bubo</i> Alexander, 1918 | 좀잠자리각다귀 |

Family 2. Syrphidae 꽃등에과

- | | |
|---|---------|
| 1. <i>Eristalis tenax</i> (Linnaeus, 1758) | 꽃등에 |
| 2. <i>Helophilus virgatus</i> Coquillett, 1898 | 수중다리꽃등에 |
| 3. <i>Melanostoma scalare</i> (Fabricius, 1794) | 광꽃등에 |

Family 3. Tephritidae 과실파리과

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|---|--------|
| 1. <i>Campiglossa hirayamae</i> (Matsumura, 1916) | 국화과실파리 |
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Family 4. Tachinidae 기생파리과

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|---|--|
| 1. <i>Tachina politula</i> (Coquillett, 1898) | |
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