

Lepidopterous Insects Composition in Jindo Island, Korea in Summer

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ABSTRACT

We surveyed the biodiversity of lepidopterous insects in Jindo Island using UV bucket trap in July 2016 to determine the relationship between surrounding environment and ecosystem in order to contribute to biodiversity conservation and management of coastal islands in Korea. Based on our survey results, a total of 262 lepidopterous insect species in 16 families were collected from Jindo Island. Members belonging to families Noctuidae and Geometridae made up approximately half of the total species (86 species [32.82%] in Noctuidae and 44 species [16.79] in Geometridae). There were 29 species (11.07%) belonging to Crambidae and 28 species (10.69%) belonging to Pyralidae. As a result of all collections based on previous literature and this study, a total of 730 species belonging to 34 families were collected from Jindo Island, including 33 protected species, 242 species (33.15%) belonging to Noctuidae (the most abundant), 124 species (16.99%) belonging to Geometridae, 79 species (10.82%) belonging to Crambidae, and 65 species (8.90%) belonging to Pyralidae. The most frequently collected species was *Lamoria glaucalis* in this study. Our results on the diversity of lepidopterous insects will provide basic information for future investigation on diverse changes in the ecosystem of Jindo Island, Korea.

Keywords: lepidopterous insect, diversity, Jindo Island, bucket trap, Korea

INTRODUCTION

Jindo Island is the third largest island and located in province of Jeollanam-do in South Korea. The island is the principle island among the cluster of 230 islets in the south western part of the Korean peninsula. The island has many park reserves like the Dadohae National Marine Park, historical relics and sites. According to the weather data from Haenam meteorological station closest to the investigation, the average temperature for the year is 14.4°C, and the mean annual precipitation is 1,360.2 mm (average last 30 years, National Weather Service) (Korea Meteorological Administration, 2013).

National Institute of Environmental Research (2012a, 2012b, 2012c, 2012d, 2012e, 2012f) studies on the insect fauna on Jindo Island reported 671 species belonging to 108 families of 12 Orders and identified 412 species of 28 families in lepidopterous insects. Also Sohn et al. (2005) are

reported a total of 573 lepidopterous species belonging to 37 families. The objective of the present study was to clarify insect fauna from Jindo Island. The results of this study might offer distinctive information for biodiversity conservation and management of coastal islands in Korea. We focused on lepidopterous insect fauna to provide basic information for future research studies to investigate the causes of diverse changes in the ecosystem of Jindo Island.

MATERIALS AND METHODS

Since insects have diversified habitats and behavioral habits, we used as many different collection methods as possible according to the characteristics of adults of each taxonomic group. This research targeted samples caught by installing UV bucket trap. To collect lepidopterous insects in the entire Jindo Island, one circular 12 W UV bucket trap powered by

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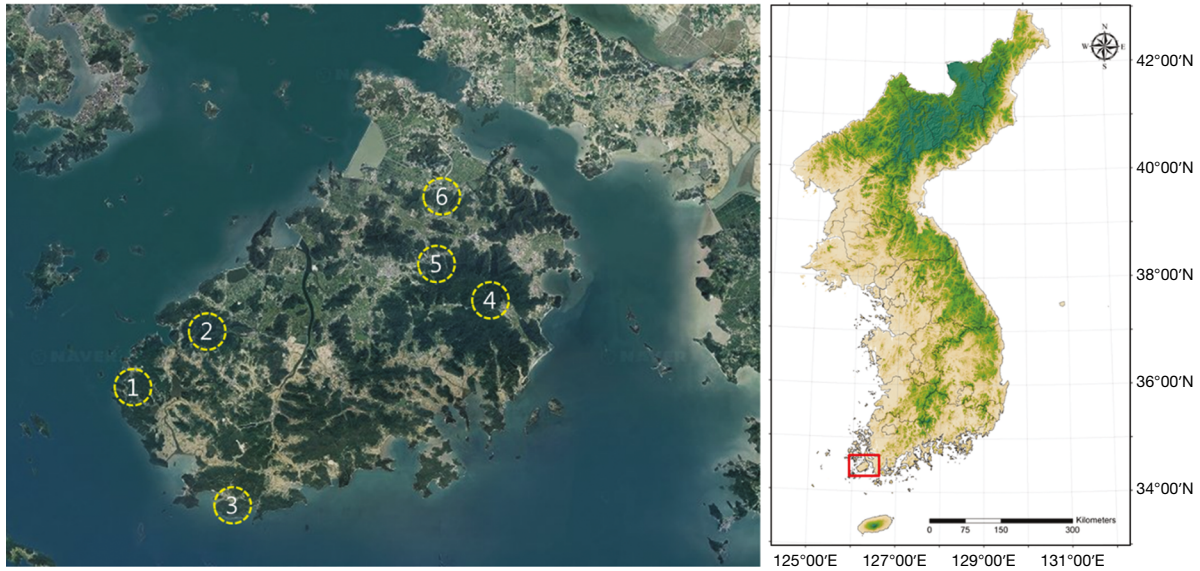
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12 V battery (Bioquip, Rancho Dominguez, CA, USA) was installed in a spot. UV bucket traps were installed at 6 sites (Fig. 1) where insects could be collected automatically. Collecting activities were focused on lepidopterous insects that occupied the largest taxa among insects of the forest ecosys-

tem. Lepidopterous insects caught in the trap were collected the next day. They were killed by ethyl-acetate and KCN.

Insect specimens were classified at family level. They were identified based on the description in the ‘Checklist of Korean Insects (Paek et al., 2010).’



Site	Habitat types	Date	GPS coordination
1	Geubchisan	Small hilly area, coniferous forest (pine tree)	6–7 Jul 2016
2	Jiryeksan	Mixed forest	6–7 Jul 2016
3	Cheondungsan	Small hilly area, coniferous forest (pine tree)	7–8 Jul 2016
4	Cheomchalsan-1	Coniferous forest (pine tree)	7–8 Jul 2016
5	Cheomchalsan-2	Mixed forest	8–9 Jul 2016
6	Godusan	Small hilly area, coniferous forest (pine tree)	8–9 Jul 2016

Fig. 1. Study areas and dates of field survey in Jindo Island.

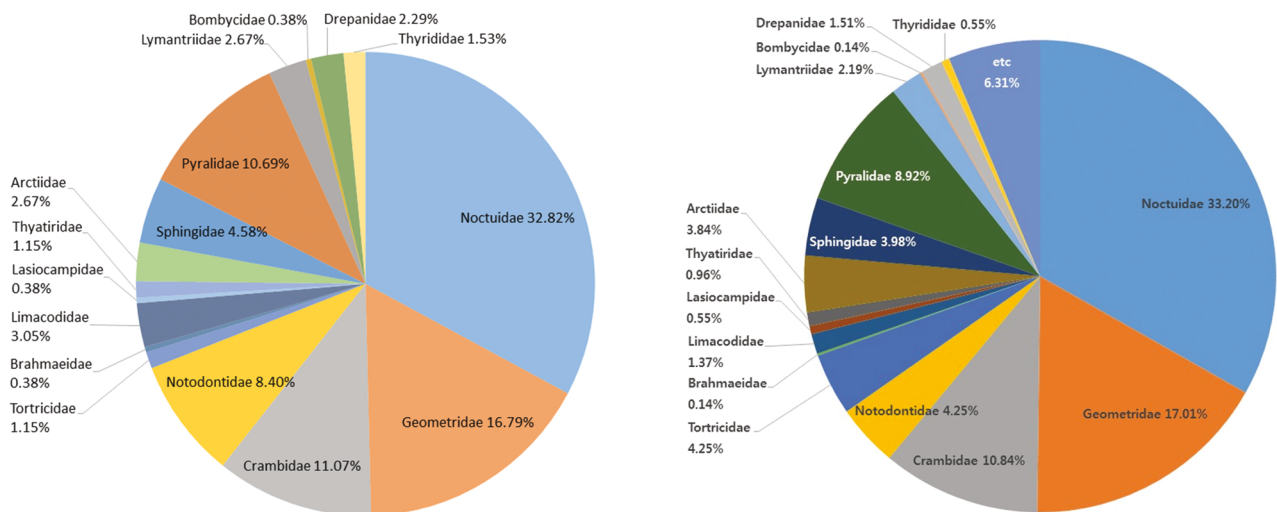


Fig. 2. Taxonomic group composition of the lepidopterous insect on Jindo (left, surveys; right, all the collections).

RESULTS AND DISCUSSION

Taxonomic composition

From the surveys, a total of 262 insect species belonging to 16 families were collected from Jindo Island. Members of Noctuidae and Geometridae made up approximately half of the total species. There were 86 species (32.82%) belonging to Noctuidae and 44 species (16.79) belonging to Geometridae. There were 29 species (11.07%) belonging to Crambidae and 28 species (10.69%) belonging to Pyralidae. As a result of all collections based on literature and this study, 730 species belonging to 34 families were identified for Jindo Island, including 33 protected species. There are 242 species (33.15%) belonging to Noctuidae, which is the most abundant in the collections. There are 124 species (16.99%) belonging to Geometridae, 79 species (10.82%) belonging

to Crambidae, and 65 species (8.90%) belonging to Pyralidae (Table 1, Fig. 2, Appendix 1).

In the 6 study sites of this study, Jiryeoksan (S2) showed the highest species diversity with 268 individuals (141 species), followed by Geubchisan (S1) with 236 individuals (99 species), Godusan (S6) with 155 individuals (89 species), Cheondungsan (S3) with 155 individuals (79 species), Cheomchalsan-2 (S5) with 119 individuals (69 species), and Cheomchalsan-1 (S4) with 118 individuals (69 species). For individuals collected, there were 766 individuals belonging to Noctuidae, the largest family in Jindo Island, followed by 452 individuals belonging to Pyralidae, 439 individuals belonging to Crambidae, 370 individuals belonging to Geometridae, and 185 individuals belonging to Notodontidae (Appendix 1).

The most frequently collected species was *Lamoria glau-*

Table 1. The total number of lepidopterous insect species and individuals in the results of previous literatures and the present study in Jindo Island

Family	2016		2012		2005		Total		Relative dominance (%)
	No. of species	No. of individuals	No. of species	No. of individuals	No. of species	No. of individuals	No. of species	No. of individuals	
Noctuidae	86	248	134	281	166	237	242	766	33.15
Geometridae	44	131	68	142	85	166	124	439	16.99
Crambidae	29	169	50	110	46	91	79	370	10.82
Notodontidae	22	82	18	42	24	61	31	185	4.25
Tortricidae	3	3	8	18	25	59	31	80	4.25
Oecophoridae	–	–	4	7	4	153	6	161	0.82
Brahmaeidae	1	1	1	1	1	1	1	2	0.14
Ctenuchidae	–	–	1	2	1	1	1	3	0.14
Zygaenidae	–	–	3	5	2	11	3	16	0.41
Limacodidae	8	12	6	25	9	30	10	67	1.37
Epiplemlidae	–	–	2	3	2	2	2	5	0.27
Lasiocampidae	1	4	3	5	2	2	4	11	0.55
Saturniidae	–	–	3	4	2	2	4	6	0.55
Lecithoceridae	–	–	1	1	1	5	2	6	0.27
Gelechiidae	–	–	1	1	11	34	12	35	1.64
Thyatiridae	3	14	7	12	5	6	7	32	0.96
Arctiidae	7	13	14	21	25	31	28	65	7.12
Sphingidae	12	36	21	50	25	36	29	122	3.97
Pyralidae	28	204	43	86	40	162	65	452	8.90
Lymantriidae	7	41	11	26	11	28	16	95	2.19
Bombycidae	1	2	–	–	1	2	1	4	0.14
Cossidae	–	–	1	5	1	2	1	7	0.14
Drepanidae	6	44	5	14	9	14	11	72	1.51
Gracillariidae	–	–	1	1	1	1	1	1	0.14
Psychidae	–	–	2	4	–	–	2	4	0.27
Yponomeutidae	–	–	1	1	1	43	3	45	0.41
Nolidae	–	–	–	–	1	1	1	1	0.14
Cochylidae	–	–	–	–	2	2	2	2	0.27
Stathmopodidae	–	–	–	–	1	1	1	1	0.14
Tineidae	–	–	–	–	1	1	1	1	0.14
Blastobasidae	–	–	–	–	2	4	2	4	0.27
Sessidae	–	–	–	–	1	1	1	1	0.14
Epicopeiidae	–	–	–	–	1	1	1	1	0.14
Thyrididae	4	7	3	5	3	6	4	18	0.55
Total	262	1,051	412	872	512	1,197	730	3,080	

Table 2. List of notable and legally protected lepidopterous insects from Jindo Island

Classification		Species
Endangered species	Level I	–
	Level II	–
Management of expotable species		<i>Actias artemis</i> , <i>Actias gnoma</i> , <i>Ambulyx japonica koreana</i> , <i>Antheraea yamamai</i> , <i>Comibaena tenuisaria</i> , <i>Dichomeris lespedezae</i> , <i>Dichomeris strictella</i> , <i>Endotricha parki</i> , <i>Goniorhynchus exemplaris</i> , <i>Hedya auricristana</i> , <i>Hyposemansis albipuncta</i> , <i>Lymantria dispar</i> , <i>Metaeuchrominus flavofascialis</i> , <i>Moma tsushimana</i> , <i>Oruza kunsuki</i> , <i>Ourapteryx persica</i> , <i>Problepsis diazoma</i> , <i>Promalactis odaiensis</i> , <i>Pyrausta mutuurai</i> , <i>Rhodoneura shini</i> , <i>Samia Cynthia</i> , <i>Sinomphisa plagialis</i> , <i>Teliphisa albifusa</i>
Endemic species		<i>Dichomeris lespedezae</i> , <i>Dichomeris strictella</i> , <i>Metaeuchrominus flavofascialis</i> , <i>Oruza kunsuki</i> , <i>Promalactis odaiensis</i> , <i>Rhodoneura shini</i> , <i>Teleiodes yanyangensis</i> , <i>Tornodoxa longiella</i>
Korean red list		–
IUCN red list		–
Climate-sensitive indicator species		<i>Macrauzata maxima</i> , <i>Marumba spectabilis</i>

IUCN, International Union for Conservation of Nature.

calis in all collections. It was also the most dominant species collected in this study. Other frequently caught species were species belonging to Noctuidae (including *Hydrillodes funeralis* and *Hydrillodes pacificus*), Crambidae (including *Bradina geminalis*, *Pleuroptya chlorophanta*, *Herpetogramma luctuosalis*, and *Tyspanodes hypsalis*), and Pyralidae (such as *Herculia pelagalis*) (Appendix 1).

Protected species

There were no endangered species or government protected species found in any of these samples. However, there were four Endemic species and one climate-sensitive indicator species (Table 2).

We enumerated the 730 insected species distributed in Jindo Island based on the present study and previous literatures. Further detailed studies including seasonal surveys using other methods are needed to investigate insects in this area for the purpose of biodiversity conservation and management of coastal islands in Korea.

ACKNOWLEDGMENTS

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Appendix 1. Taxonomic list of the lepidopterous insects in Jindo Island

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}		2005 ^g
			S1	S2	S3	S4	S5	S6			
Gracillariidae	가시나방과	<i>Caloptilia sapporella</i>	-	-	-	-	-	-	-	1	6
		<i>Cochylidia contumescens</i>	-	-	-	-	-	-	-	-	1
Cochylidae	가시잎말이나방과	<i>Eupoecilia ambiguella</i>	-	-	-	-	-	-	-	-	1
		<i>Agnidra scabiosa</i>	3	2	4	-	-	-	-	5	1
Drepanidae	갈고리나방과	<i>Callidrepana patrana</i>	-	-	-	-	-	-	-	-	2
		<i>Deroca inconclusa</i>	-	-	-	-	-	-	-	-	1
		<i>Drepana curvatula</i>	-	2	-	-	2	2	-	-	1
		<i>Macrauzata maxima</i>	-	-	-	-	-	-	-	-	1
		<i>Macrocilix mysticata</i>	-	-	-	1	-	-	-	-	1
		<i>Nordstr omia grisearia</i>	-	-	-	-	-	-	-	-	1
		<i>Nordstr omia japonica</i>	3	2	4	3	2	1	2	2	4
		<i>Oreta pulchripes</i>	4	-	-	2	2	2	3	1	1
		<i>Pseudalbara parvula</i>	-	1	-	-	-	-	-	-	1
		<i>Tridrepana crocea</i>	-	-	-	-	-	-	-	-	1
		<i>Stathmopoda auriferella</i>	-	-	-	-	-	-	-	-	1
		<i>Morphohaga bucephala</i>	-	-	-	-	-	-	-	-	1
		<i>Zeuzera multistrigata</i>	-	-	-	-	-	-	-	5	2
		<i>Bombyx mandarina</i>	-	2	-	-	-	-	-	-	2
Bombycidae	누에나방과	<i>Arctornis albus</i>	-	-	-	-	-	-	-	-	4
		<i>Arctornis kumatai</i>	4	2	-	-	2	2	5	1	
Lymantriidae	독나방과	<i>Calliteara argentata</i>	-	-	-	-	-	-	-	1	
		<i>Calliteara conjuncta</i>	-	-	-	-	-	-	-	1	
Cossidae	굴벌레나방과	<i>Calliteara pseudobietis</i>	-	-	-	-	-	-	-	-	1
		<i>Cifuna locuples</i>	-	-	2	2	2	2	2	2	14
		<i>Euproctis piperita</i>	2	2	2	-	-	-	-	2	1
		<i>Euproctis pseudoconspersa</i>	-	3	-	-	-	-	-	3	1
		<i>Euproctis pulverea</i>	-	2	-	-	-	-	-	4	2
		<i>Euproctis similis</i>	-	-	-	-	-	-	-	1	1
		<i>Euproctis subflava</i>	3	2	1	2	-	-	-	2	1
		<i>Euproctis torasan</i>	-	-	-	-	-	-	-	-	1
		<i>Lymantria dispar</i>	-	-	-	-	-	-	-	4	1
		<i>Lymantria monacha</i>	-	-	1	-	-	-	-	-	1
		<i>Neocifuna eurydice</i>	-	-	2	1	3	-	-	-	1
		<i>Pida niphonis</i>	-	-	-	-	-	-	-	-	1
		<i>Acrobasis hollandella</i>	-	-	-	-	-	-	-	-	2
		<i>Acrobasis injunctella</i>	-	-	-	-	-	-	-	-	1
Pyralidae	명나방과	<i>Acrobasis pseudodichromella</i>	-	-	-	-	-	-	-	-	1
		<i>Aphomia zelleri</i>	1	-	-	-	-	-	-	-	1
		<i>Arippara indicator</i>	-	-	-	1	-	-	-	5	5
		<i>Assara funerella</i>	-	-	-	-	-	-	-	-	1
		<i>Bostra nanalis</i>	-	1	-	-	-	-	-	-	1
		<i>Calgaia defiguralis</i>	-	-	-	-	-	-	-	2	1
		<i>Cnaphalocrocis medinalis</i>	-	-	-	-	-	-	-	5	1

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
			S1	S2	S3	S4	S5	S6		
Pyralidae	명나방과	<i>Conobathra bellulella</i>	-	-	-	-	-	-	1	1
		<i>Conobathra obrutella</i>	-	-	-	-	-	-	-	-
		<i>Datanoides fasciata</i>	-	-	-	-	-	-	-	1
		<i>Dionyctria abietella</i>	-	-	-	-	-	-	-	1
		<i>Dionyctria sylvestrella</i>	-	-	-	-	-	-	-	-
		<i>Endotricha consocia</i>	-	-	-	-	-	-	3	1
		<i>Endotricha kuznetzovi</i>	-	-	-	-	-	-	1	-
		<i>Endotricha minimalis</i>	-	-	-	-	-	-	1	-
		<i>Endotricha olivacealis</i>	-	-	-	-	-	-	2	1
		<i>Endotricha parki</i>	-	-	-	-	-	-	1	1
		<i>Epilepia dentata</i>	-	-	-	-	-	-	1	3
		<i>Etrelioides bipartitellus</i>	-	-	-	-	-	-	1	-
		<i>Etielioides sejunctellus</i>	-	-	-	-	-	-	2	-
		<i>Eulophopalpia pauperalis</i>	-	-	-	-	-	1	-	-
		<i>Herculia pelasgalis</i>	6	5	-	-	-	-	5	1
		<i>Lamoria glaucalis</i>	19	24	16	-	-	15	5	-
		<i>Lepidogma melanobasis</i>	-	2	-	-	-	2	-	-
		<i>Lista ficki</i>	-	3	2	-	-	-	-	3
		<i>Locastra muscosalis</i>	3	2	2	-	-	2	5	3
		<i>Maruca testulalis</i>	-	-	-	-	-	-	1	1
		<i>Nephoterix bicolorella</i>	1	-	-	-	-	-	-	-
		<i>Nephoterix tomisawai</i>	-	-	-	-	-	-	-	-
		<i>Nyctegretis triangulella</i>	-	-	-	-	-	-	-	2
		<i>Oncocera semirubella</i>	3	-	2	-	-	2	4	4
		<i>Orthaga achatina</i>	-	2	-	-	-	-	1	1
		<i>Orthaga euadrasalis</i>	-	-	-	-	-	-	2	1
		<i>Orthaga olivacea</i>	-	2	2	-	-	2	1	1
		<i>Orthaga onerata</i>	4	3	-	-	-	-	3	1
		<i>Orthopygia glaucinalis</i>	-	-	-	-	-	-	-	1
		<i>Orthopygia nannodes</i>	4	2	-	-	-	2	1	1
		<i>Orthopygia placens</i>	-	3	-	-	3	3	3	1
		<i>Orybina regalis</i>	-	-	-	-	-	-	-	3
		<i>Phycitodes subcretacellus</i>	-	-	-	-	-	-	-	-
		<i>Protoctiella bipunctella</i>	-	-	-	-	-	-	1	-
		<i>Pseudacrobasis nankingella</i>	-	-	-	-	-	-	1	-
		<i>Pseudocadra cuprotaeniella</i>	-	-	-	-	-	-	-	2
		<i>Pyralis farinalis</i>	-	-	-	-	-	-	-	1
		<i>Pyralis regalis</i>	4	2	-	-	-	-	-	3
		<i>Sacada approximans</i>	-	-	-	-	-	-	-	1
		<i>Salma amica</i>	-	2	-	-	-	-	1	1
		<i>Sandrabatis crassiella</i>	-	-	-	-	-	-	-	43
		<i>Spatulipalpia albiatrialis</i>	-	-	-	-	-	-	-	-
		<i>Stemmatophora albifimbrialis</i>	-	1	-	-	1	-	-	1

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}		2005 ^g
			S1	S2	S3	S4	S5	S6			
Pyralidae	명나방과	<i>Stemmatophora valida</i>	2	1	-	1	-	-	1	-	31
		<i>Stericta kogii</i>	3	-	-	-	-	-	-	-	1
		<i>Tamraca torridalis</i>	1	3	2	2	2	1	5	5	1
		<i>Tegulifera bicoloralis</i>	-	-	2	2	-	-	1	-	-
		<i>Teliphasa elegans</i>	1	-	1	-	-	-	2	-	1
		<i>Teliphasa albifusa</i>	-	-	-	-	-	-	-	1	-
		<i>Termioptycha inimica</i>	-	-	1	-	-	-	-	1	-
		<i>Termioptycha margarita</i>	2	-	-	-	-	-	-	1	2
		<i>Termioptycha nigrescens</i>	-	-	1	-	-	-	-	-	-
		<i>Trachycera paradiachromella</i>	-	-	-	-	-	1	-	-	-
		<i>Trebania flavifrontalis</i>	-	-	-	-	-	-	-	-	30
		<i>Trichotophysa jucundalis</i>	-	-	-	-	1	1	-	-	2
		<i>Neoblastobasis decolor</i>	-	-	-	-	-	-	-	-	1
		<i>Neoblastobasis spiniharpella</i>	-	-	-	-	-	-	-	-	2
Blastobasidae	밑두리뿔나방과	<i>Acosmeryx castanea</i>	-	-	-	-	-	-	-	-	1
		<i>Acosmeryx naga</i>	-	-	-	2	-	1	4	-	1
		<i>Agrius convolvuli</i>	-	-	-	-	-	-	-	1	1
		<i>Ambulyx japonica koreana</i>	-	-	-	-	-	-	2	-	2
		<i>Ambulyx ochracea</i>	-	-	-	-	-	-	1	-	2
		<i>Ambulyx schaufelbergieri</i>	-	-	-	-	-	-	-	-	4
		<i>Ampelophaga rubiginosa</i>	-	1	-	-	-	1	5	-	1
		<i>Aspledon himachala</i>	-	-	-	-	-	-	1	-	1
		<i>Callambulyx tatarinovi</i>	-	2	-	1	-	1	3	-	1
		<i>Cephonodes hylas</i>	-	-	-	-	-	-	-	-	1
Sphingidae	박각시과	<i>Clanis bilineata</i>	-	-	-	-	-	-	2	-	1
		<i>Clanis undulosa</i>	-	-	-	-	-	-	-	-	1
		<i>Deilephila elenor</i>	-	-	-	-	-	-	2	-	1
		<i>Dolbina exacta</i>	3	-	-	-	-	-	2	3	1
		<i>Dolbina tancrei</i>	-	1	-	-	-	-	-	3	3
		<i>Hemaris affinis</i>	-	-	-	-	-	-	-	-	1
		<i>Macroglossum pyrrhosticta</i>	-	-	-	-	-	-	-	2	1
		<i>Macroglossum stellaparum</i>	-	-	-	-	-	-	-	-	1
		<i>Marumba gaschkewitschi</i>	-	-	-	-	-	-	-	1	0
		<i>Marumba jankowskii</i>	-	-	-	-	1	-	-	-	-
		<i>Marumba spectabilis</i>	-	-	-	-	1	-	-	2	1
		<i>Marumba sperchius</i>	2	1	-	-	-	1	-	2	1
		<i>Parum colligata</i>	-	-	-	-	-	-	2	-	1
		<i>Philoschingia dissimilis</i>	1	2	-	-	-	1	-	3	-
		<i>Psilogamma increta</i>	-	-	-	-	-	-	1	-	1
		<i>Rhagastis mongoliana</i>	1	2	-	-	-	1	2	4	3
<i>Smerinthus planus</i>	-	-	-	-	-	-	-	-	1		
<i>Theretra clotho</i>	-	-	-	-	-	-	-	3	-		
<i>Theretra japonica</i>	-	-	-	-	-	-	-	4	3		

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
			S1	S2	S3	S4	S5	S6		
Noctuidae										
		밤나방과								
	<i>Acontia bicolora</i>	노랑무늬포마밤나방	-	-	-	-	-	-	2	
	<i>Acrapex azumai</i>	애밤나방	-	-	-	-	-	-	-	
	<i>Acronicta (Plataplecta) pulverosa</i>	흰배저녁나방	-	-	-	-	-	-	-	
	<i>Acronicta hercules</i>	점줄저녁나방	-	-	-	-	-	-	1	
	<i>Acronicta major</i>	왕뿔무늬저녁나방	-	-	-	-	-	-	-	
	<i>Acronicta rumicis</i>	배저녁나방	-	-	-	-	-	-	5	
	<i>Adrapsa simplex</i>	별박이수염나방	-	-	-	-	-	-	-	
	<i>Adris tyrannus</i>	으름밤나방	-	-	-	-	-	-	1	
	<i>Agrotis ipsilon</i>	검거세미밤나방	2	-	-	-	-	-	3	
	<i>Amphipyra acheron</i>	뒷검은까마귀밤나방	-	1	-	-	-	-	-	
	<i>Amphipyra livida</i>	까마귀밤나방	5	2	2	-	-	-	4	
	<i>Amphipyra monolitha</i>	흰눈까마귀밤나방	-	-	-	-	-	-	1	
	<i>Amphipyra pyramidea</i>	피라미드까마귀밤나방	-	-	-	-	-	-	-	
	<i>Anachrostitis nigripunctalis</i>	흰무늬짚틀나방	-	-	-	-	-	-	-	
	<i>Anapamea incerta</i>	포마주황일독밤나방	-	-	-	-	-	-	-	
	<i>Anomis commoda</i>	큰뿔은포밤나방	-	-	-	-	-	-	1	
	<i>Anomis flava</i>	무화과밤나방	-	-	-	-	-	-	-	
	<i>Anomis mesogona</i>	무궁화잎밤나방	-	-	-	-	-	-	-	
	<i>Anuga multiplicans</i>	긴수염비행기밤나방	-	2	-	-	-	-	1	
	<i>Arcte coerulea</i>	암청색줄무늬밤나방	-	-	-	-	-	-	-	
	<i>Artena dotata</i>	푸른띠밤나방	1	-	-	-	-	-	2	
	<i>Athetis albignata</i>	흰점국화밤나방	-	-	-	-	-	-	2	
	<i>Athetis cinerascens</i>	흑점밤나방	-	-	-	-	-	-	-	
	<i>Athetis dissimilis</i>	뒷흰날개담쟁이밤나방	1	-	-	-	-	-	-	
	<i>Athetis gluteosa</i>	각시띠담쟁이밤나방	-	-	-	-	-	-	-	
	<i>Athetis stellata</i>	국화밤나방	-	-	-	-	-	-	1	
	<i>Athetis striolata</i>	줄담쟁이밤나방	-	-	-	-	-	-	-	
	<i>Atrachea nitens</i>	소루쟁이밤나방	-	-	-	-	-	-	1	
	<i>Aventiola pusilla</i>	꽃무늬포마밤나방	-	-	-	-	-	-	-	
	<i>Axylla putris</i>	책은밤나방	1	1	-	-	-	-	4	
	<i>Blasticorhinus ussuriensis</i>	우수리밤나방	2	2	2	-	-	-	4	
	<i>Blenina senex</i>	나뭇잎밤나방	-	-	-	-	-	-	-	
	<i>Bomolocha melanica</i>	먹구름수염나방	-	-	-	-	-	-	1	
	<i>Bomolocha stygiana</i>	고개무늬수염나방	-	1	-	-	-	-	-	
	<i>Brevipecten consanguis</i>	남방쌍무늬짚틀나방	-	1	-	-	-	-	2	
	<i>Bryophila granitalis</i>	이끼밤나방	-	-	-	-	-	-	1	
	<i>Bryophilina mollicula</i>	연푸른포마밤나방	-	1	-	-	-	-	1	
	<i>Callopietria albolineola</i>	흰줄어린밤나방	-	-	-	-	-	-	4	
	<i>Callopietria duplicans</i>	제주어린밤나방	-	-	-	-	-	-	-	
	<i>Callopietria juvenina</i>	어린밤나방	-	-	-	-	-	-	3	
	<i>Callopietria repleta</i>	얼룩어린밤나방	-	-	-	-	-	-	1	
	<i>Calyptra gruesa</i>	근갈고리밤나방	-	2	-	-	-	-	6	
	<i>Calyptra hokkaida</i>	북방갈고리밤나방	-	-	-	-	-	-	-	

Appendix 1. Continued

Scientific name	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
	Families	Species	S1	S2	S3	S4		
Noctuidae	밤나방과							
<i>Calypta thalictri</i>		갈고리밤나방	-	-	-	-	-	1
<i>Catocala dissimilis</i>		큰흰무늬박이뿔날개나방	-	-	-	-	-	2
<i>Catocala doerriesi</i>		붉은줄노랑뿔날개나방	1	-	-	1	-	2
<i>Catocala dula</i>		붉은뿔날개나방	-	-	-	1	-	1
<i>Catocala fulminea</i>		광대노랑뿔날개나방	-	-	-	-	-	1
<i>Catocala jonasi</i>		뾰족노랑뿔날개나방	-	1	-	-	-	-
<i>Catocala praegnax</i>		들노랑뿔날개나방	-	1	-	-	-	1
<i>Chibidokuga hypenodes</i>		포마검짚틀나방	-	-	-	-	-	1
<i>Chrysodeixis eriosoma</i>		붉은금무늬밤나방	1	-	-	-	-	-
<i>Chrysothrum amatum</i>		사랑밤나방	1	-	-	-	2	1
<i>Cidariplura gladiata</i>		흰견뿔수염나방	-	-	-	-	-	1
<i>Coenobia orientalis</i>		검줄물가밤나방	-	-	-	-	-	4
<i>Colocasia mus</i>		털보버짐나방	-	-	-	-	-	1
<i>Condica illecta</i>		회미무늬밤나방	-	-	-	-	-	1
<i>Conistra griseocens</i>		검줄무늬밤나방	-	-	-	-	-	1
<i>Corgatha dictaria</i>		흰줄포마밤나방	-	-	-	-	-	1
<i>Corgatha nitens</i>		붉은포마밤나방	1	-	-	-	-	3
<i>Corgatha pygmaea</i>		검은줄포마밤나방	-	-	-	1	-	-
<i>Corsa petrina</i>		잔줄밤나방	-	-	-	-	-	2
<i>Cosmia achatina</i>		제주포마밤나방	-	1	-	-	1	6
<i>Cosmia affinis</i>		느릅밤나방	-	1	-	-	-	1
<i>Cosmia camptostigma</i>		회색쌍줄밤나방	1	-	-	-	-	-
<i>Craniophora fasciata</i>		굵은무늬저녁나방	-	-	-	-	-	1
<i>Craniophora jankowskii</i>		지옥저녁나방	-	-	-	-	-	1
<i>Craniophora odade</i>		얼룩저녁나방	-	1	-	-	-	-
<i>Cryphia obscura</i>		피이깨밤나방	-	-	-	-	-	1
<i>Ctenoplusia (Acanthoplusia) agnata</i>		굵은무늬밤나방	-	-	-	-	-	1
<i>Ctenoplusia albostriata</i>		긴금무늬밤나방	-	-	-	-	-	6
<i>Cymatophoropsis unca</i>		남방새무늬저녁나방	-	-	-	-	-	1
<i>Daddala lucilla</i>		툰날무늬얼밤나방	-	-	-	-	-	2
<i>Diarsia canescens</i>		물결밤나방	-	-	-	-	-	1
<i>Dinumma deponens</i>		검은띠밤나방	3	-	-	1	-	1
<i>Diomea cremata</i>		보라얼밤나방	-	-	-	-	-	1
<i>Diomea discisigna</i>		네눈검짚얼밤나방	-	-	2	-	-	-
<i>Diphtherocone alpium</i>		높은산저녁나방	-	1	-	-	-	2
<i>Dysgonia arctotaenia</i>		흰피수증다리밤나방	-	-	-	-	-	2
<i>Dysgonia arcuata</i>		물결수증다리밤나방	-	-	-	-	-	-
<i>Dysgonia mandschuriana</i>		복방수증다리밤나방	-	-	-	-	-	1
<i>Dysgonia maturata</i>		보라필수증다리밤나방	-	-	-	-	-	1
<i>Dysmilichia gemella</i>		검띠애기밤나방	-	-	-	-	-	2
<i>Earias pudicana</i>		붉은가밤나방	2	2	-	-	-	3
<i>Earias roseifera</i>		분홍무늬푸른밤나방	-	-	-	-	-	1
<i>Ectogonia butleri</i>		물결틀나방	-	-	-	-	-	1

Appendix 1. Continued

Families	Scientific name	2016										2012 ^{a,b,c,d,e,f}			2005 ^g	
		S1	S2	S3	S4	S5	S6	S6	S6	S6	S6					
Noctuidae	밤나방과	<i>Edessena hamada</i>	3	3	-	-	-	-	-	-	-	-	2	2	2	
		<i>Ercheia niveostrigata</i>	3	3	-	2	2	-	-	-	-	-	5	5	1	
		<i>Ercheia umbrosa</i>	2	2	2	2	2	-	-	-	-	-	-	-	1	
		<i>Erebus ephesperis</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	1
		<i>Erygia apicalis</i>	-	-	-	1	2	-	-	-	-	-	-	2	2	2
		<i>Erythroplusia pyropia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		<i>Erythroplusia rutilifrons</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Eutelia geyeri</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	1
		<i>Euwilemania angulata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		<i>Euxoa sibirica</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Gabala argentata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Gadirtha uniformis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Gelastocera exusta</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	1
		<i>Gelastocera exusta</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Gerbothodes angusta</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Gonepatica opalina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	4
		<i>Hadena rivularis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		<i>Hadennia incongruens</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	-
		<i>Hadjina chinensis</i>	-	2	-	-	-	-	-	-	-	-	-	2	2	1
		<i>Helicoverpa armigera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		<i>Helicoverpa assulta</i>	-	-	-	-	-	-	-	-	-	-	-	3	3	-
		<i>Hemipsestra fallax</i>	-	-	-	-	-	-	-	-	-	-	-	2	2	1
		<i>Herminia arenosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		<i>Herminia dolosa</i>	-	-	-	1	-	-	-	-	-	-	-	1	1	1
		<i>Herminia innocens</i>	-	1	-	1	-	-	-	-	-	-	-	1	1	1
		<i>Herminia tarsicrinalis</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	1
		<i>Herminia tarsicrinalis</i>	-	-	-	-	-	-	-	-	-	1	1	2	2	1
		<i>Herminia tarsicrinalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	3
		<i>Hermionassa cecilia</i>	-	-	-	-	2	-	-	-	-	2	2	-	-	1
		<i>Hipoepa fractalis</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	-
		<i>Hoplodrina implacata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		<i>Hydrilodes funeralis</i>	7	3	4	3	4	5	-	-	-	-	-	6	6	1
		<i>Hydrilodes pacificus</i>	5	3	3	4	5	-	-	-	-	-	-	-	-	-
<i>Hypena (Bomolocha) bicoloralis</i>	-	-	-	-	-	-	-	-	-	-	-	2	2	1		
<i>Hypena amica</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	-		
<i>Hypena claripennis</i>	-	-	-	-	-	-	-	-	-	-	-	6	6	1		
<i>Hypena trigonalis</i>	-	1	-	1	-	-	-	-	-	1	1	1	1	1		
<i>Hypena (Bomolocha) nigrobasalis</i>	-	-	-	-	-	-	-	-	-	-	-	1	1	-		
<i>Hypenodes curvilinea</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-		
<i>Hyperstrotia flavipuncta</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Hypersypnoides submarginata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Hypopyra vespertilio</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Hyposada brunnea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2		
<i>Hyposemansis albipuncta</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-		

Appendix 1. Continued

Scientific name	2016										2012 ^{a,b,c,d,e,f}	2005 ^g	
	Families	Species	S1	S2	S3	S4	S5	S6	S6	S6			
Noctuidae	밤나방과												
		<i>Idia curvipalpis</i>		1								1	
		<i>Iragades nobilis</i>		1									1
		<i>Lacera procellosa</i>											1
		<i>Lagoptera juno</i>										5	1
		<i>Leioskola mollis</i>		1	1								3
		<i>Lophomilia polybapta</i>											2
		<i>Lophoptera hayesi</i>											1
		<i>Lophoruza pulcherrima</i>		1								6	
		<i>Lygephila cracca</i>					1						
		<i>Lygephila maxima</i>		1	1	2							1
		<i>Lygephila vulcanea</i>		1	1							4	
		<i>Macdunnoughia hybrida</i>											
		<i>Macdunnoughia purissima</i>											1
		<i>Magda suffusa</i>										2	
		<i>Maliattha rosacea</i>											1
		<i>Maliattha signifera</i>											1
		<i>Mecodina cineracea</i>											4
		<i>Mecodina nubiferalis</i>											1
		<i>Mecodina nubiferalis</i>											1
		<i>Metopta rectifasciata</i>				1	1					3	2
		<i>Metopta rectifasciata</i>		2	2							3	1
		<i>Microxyyla confusa</i>											5
		<i>Mimachrostia fasciata</i>											2
		<i>Mimachrostia fasciata</i>											1
		<i>Mimusemia persimilis</i>											2
		<i>Mocis ancilla</i>											1
		<i>Mocis ancilla</i>											1
		<i>Moma tsushimana</i>											1
		<i>Mythimna (Aletia) flavostigma</i>											1
		<i>Mythimna (Aletia) nigri-linea</i>											1
		<i>Mythimna (Aletia) placida</i>											1
		<i>Mythimna (Analetia) postica</i>		1									1
		<i>Mythimna matsumuriana</i>											1
		<i>Mythimna stolidia</i>											1
		<i>Mythimna turca</i>		2									1
		<i>Mythimna turca</i>										3	2
		<i>Naenia contaminata</i>											
		<i>Naganoella timandra</i>											
		<i>Naranga aenescens</i>		2									
		<i>Naranga aenescens</i>		1								3	1
		<i>Necodina subviolacea</i>											
		<i>Necrotothoripa hamponi</i>											1
		<i>Necrotothoripa hamponi</i>											1
		<i>Neustrotia rectilineata</i>											3
		<i>Niphonyx segregata</i>		2	1							4	2
		<i>Nodaria tristis</i>											1
		<i>Nonagria turpis</i>											1
		<i>Nonagria turpis</i>											1
		<i>Oligia fodinae</i>											1
		<i>Oligonyx vulnerata</i>											2

Appendix 1. Continued

Families	Scientific name	2016										2012 ^{a,b,c,d,e,f}	2005 ^g			
		S1	S2	S3	S4	S5	S6									
Noctuidae	밤나방과	Species	<i>Simplicia rectalis</i>	-	-	-	-	-	-	-	-	-	-	1		
			<i>Sineugraphe bipartita</i>	-	-	1	-	-	-	-	-	-	-	2	-	
			<i>Sineugraphe exusta</i>	-	-	-	-	-	-	-	-	-	-	-	1	1
			<i>Sineugraphe oceanica</i>	1	1	2	1	-	-	-	-	-	-	-	2	1
			<i>Spiragifera biplagiata</i>	2	2	-	2	-	-	-	-	-	-	-	4	7
			<i>Spirama helicina</i>	-	-	-	-	-	-	-	-	-	-	-	2	1
			<i>Spirama retorta</i>	2	-	-	-	1	1	-	-	-	-	-	3	1
			<i>Spodoptera depravata</i>	-	-	-	-	-	1	-	-	-	-	-	2	-
			<i>Spodoptera exigua</i>	-	-	-	-	-	-	-	-	-	-	-	3	1
			<i>Spodoptera litura</i>	-	-	-	-	-	-	-	-	-	-	-	1	1
			<i>Spodoptera pecten</i>	-	-	-	-	-	-	-	-	-	-	-	1	1
			<i>Stenhyphena nigripunctata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Stenoloba clara</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
			<i>Synpoides picta</i>	-	2	-	-	-	-	-	-	-	-	-	-	2
			<i>Trachea atriplicis</i>	-	-	-	-	-	-	-	-	-	-	-	2	2
			<i>Trichoplusia ni</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
			<i>Troosema sordidum</i>	-	-	-	-	-	-	-	-	-	1	-	2	1
			<i>Virgo datanidia</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
			<i>Xestia c-nigrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Xestia stupenda</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Zanclognatha fumosa</i>	1	-	-	-	-	-	-	-	-	-	-	2	1
			<i>Zanclognatha helva</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
			<i>Zanclognatha leechi</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Zanclognatha lunalis</i>	-	-	-	-	-	-	-	-	-	-	-	2	-
			<i>Zanclognatha lunalis</i>	-	-	-	-	-	-	-	-	1	-	-	2	-
			<i>Zanclognatha lunalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
			<i>Zanclognatha stramentacealis</i>	-	-	-	-	-	-	-	-	-	1	-	-	-
			<i>Zanclognatha sugii</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Aglaeomorpha histrio</i>	-	-	-	-	-	-	-	-	1	1	-	-	1
			<i>Agrisius fuliginosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Asuridia carnipicta</i>	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Chionarctia nivea</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Cyana hamata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Eilema griseola</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Eilema japonica</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Eilema nankingica</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Hyphantria cunea</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			
<i>Lithosia quadra</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Mitochrista aberrans</i>	1	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Mitochrista miniata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Mitochrista pallida</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Mitochrista striata</i>	2	2	-	-	-	-	-	-	-	2	-	-	1			
<i>Mitochrista ziczac</i>	-	1	-	-	-	-	-	-	-	-	-	-	1			
<i>Paraona staudingeri</i>	2	1	-	-	-	-	-	-	-	-	-	-	4			

Appendix 1. Continued

Scientific name		2016										2012 ^{a,b,c,d,e,f}		2005 ^g			
Families	Species	S1	S2	S3	S4	S5	S6	S1	S2	S3	S4	S5	S6				
Limacodidae	쟁기나방과	<i>Belippa horrida</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
		<i>Latoia consocia</i>	-	-	1	-	-	-	-	-	-	-	-	-	1	3	1
		<i>Latoia sinica</i>	2	2	-	-	-	-	-	-	-	-	1	-	-	2	5
		<i>Microleon longipalpis</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	13
		<i>Monema flavescens</i>	2	2	1	-	-	-	-	-	-	-	-	-	2	5	1
		<i>Narosa fulgens</i>	1	2	3	-	-	-	-	-	-	-	-	-	2	5	1
		<i>Phlossa conjuncta</i>	-	1	-	-	-	-	-	-	-	-	-	-	1	5	3
		<i>Phrixolepia sericea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
		<i>Rhainosa angulata</i>	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
		<i>Thosea sinensis coreana</i>	2	2	1	3	2	1	1	5	5	1	1	2	1	5	1
		<i>Chalcostia remota</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4
		<i>Pidorus glaucopsis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7
		<i>Pryeria sinica</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Ctenuchidae	에기나방과	<i>Amata germana</i>	-	-	-	-	-	-	-	-	-	-	-	-	2	-	
		<i>Brahmaea certhia</i>	-	2	-	-	-	-	-	-	-	-	-	-	1	1	
Brahmaeidae	왕물결나방과	<i>Acria ceramitis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	1	
		<i>Cryptolechia malacobyrsa</i>	-	-	-	-	-	-	-	-	-	-	-	-	4	149	
Oecophoridae	원뿔나방과	<i>Periactma delegata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
		<i>Promalactis odaiensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Promalactis suzukiella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
		<i>Tyrolimnas anthraconesa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		<i>Nokona pernix</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Acleris affinatana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Adoxophyes orana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
		<i>Ancylis uncella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Archips ingentanus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Archips semistructus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Argyrotaenia congruentana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Bactra fufurana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Clepsis rurinana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
Sessidae	우리나방과	<i>Endothenia banausopsis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Endothenia remigera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Epiblema foenella</i>	-	1	-	-	-	-	-	-	-	-	-	-	5	1	
		<i>Epinotia bicolor</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Epinotia rubiginosana koraiensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Eubrochoneura altissima</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Eucosma catharaspis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Fulcrifera orientis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Gnorismoneura hoshinoi</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Grapholita deliniana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
		<i>Hedya auricristana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
		<i>Hedya walsinghami</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}			2005 ^g		
			S1	S2	S3	S4	S5	S6						
Tortricidae	잎말이나방과	<i>Homona issikii</i>	-	-	-	-	-	-	-	-	-	1		
		<i>Homona magnanima</i>	-	-	-	-	-	-	-	-	3	3		
		<i>Hoshinoa longicellana</i>	-	-	-	-	-	-	-	-	-	-	8	
		<i>Hystrichosolus spathanum</i>	-	-	-	-	-	-	-	-	-	-	3	
		<i>Meganola costalis</i>	-	-	-	-	-	-	-	-	-	-	2	
		<i>Olethreutes orthocosma</i>	-	-	-	-	-	-	-	-	-	-	11	
		<i>Pandemis corylana</i>	-	-	-	-	-	-	-	-	-	-	12	
		<i>Pseudacroclita hapalaspis</i>	-	-	-	-	-	-	-	-	-	-	1	
		<i>Pseudohedya retracts</i>	-	-	-	-	-	-	-	-	-	-	1	
		<i>Spilonota semirufana</i>	-	-	-	-	-	-	-	-	-	-	1	
		Geometridae	자나방과	<i>Stenbergmania albomaculalis</i>	-	1	-	-	-	-	-	-	4	-
				<i>Abraxas latifasciata</i>	-	-	-	-	-	-	-	-	1	14
				<i>Abraxas niphonibia</i>	-	-	-	-	-	-	-	-	4	-
				<i>Agathia carissima</i>	1	-	-	1	-	-	-	-	-	1
				<i>Agathia visenda</i>	-	-	-	-	-	-	-	-	-	1
				<i>Alcis angulifera</i>	-	-	-	-	-	-	-	-	-	1
				<i>Amraica superans</i>	-	-	-	-	-	-	-	-	1	3
				<i>Angerona prunaria</i>	-	4	-	-	-	-	-	-	1	-
				<i>Apoptelia chlororhynodes</i>	1	-	-	-	-	-	-	-	-	-
				<i>Arichanna melanaria</i>	-	3	-	-	-	-	-	-	1	-
		<i>Ascotis imparata</i>	-	-	-	-	-	-	-	-	-	5		
		<i>Ascotis selenaria</i>	-	2	-	-	-	-	-	1	6	1		
		<i>Biston regalis</i>	-	-	-	-	-	-	-	-	1	-		
		<i>Bizia aexaria</i>	-	-	-	-	-	-	-	-	1	-		
		<i>Bizia altera</i>	-	1	-	-	-	-	-	-	-	1		
		<i>Calleulepe whiteleyi</i>	-	-	-	-	-	-	-	-	-	-		
		<i>Chariaspilates formosaria</i>	-	-	-	-	-	-	-	-	1	-		
		<i>Chiasmia cinerearia</i>	-	1	-	-	-	-	-	-	1	-		
		<i>Chiasmia defixaria</i>	-	1	-	-	-	2	-	2	6	3		
		<i>Chiasmia hebesata</i>	-	1	2	-	-	-	-	1	6	3		
<i>Chlorissa oblitterata</i>	-	-	-	-	-	-	-	-	1	-				
<i>Chloromachia infracta</i>	-	-	-	-	-	-	-	-	2	1				
<i>Cleora repulsaria</i>	-	-	-	-	-	-	-	-	1	1				
<i>Comibaena amoenaria</i>	-	-	-	-	-	-	-	-	3	3				
<i>Comibaena argentataria</i>	2	-	-	-	-	1	-	-	1	1				
<i>Comibaena delicatior</i>	-	-	-	-	-	-	-	-	1	1				
<i>Comibaena procumbaria</i>	-	-	-	-	-	-	-	-	5	1				
<i>Comibaena tenuisaria</i>	-	-	-	-	-	-	-	-	-	1				
<i>Comostola subtilaria</i>	-	-	-	-	-	-	-	-	-	2				
<i>Corymica specularia</i>	1	1	-	-	-	-	-	-	1	-				
<i>Cotta incongruaria</i>	-	-	-	-	-	-	-	-	-	-	1			
<i>Ctenognophos grandinaria</i>	-	-	-	-	-	-	-	-	-	-	1			

Appendix 1. Continued

Families	Scientific name	2016										2012 ^{a,b,c,d,e,f}	2005 ^g
		S1	S2	S3	S4	S5	S6	S5	S6				
Geometridae	자나방과	Species	<i>Culcula panterinaria</i>	3	2	2	-	-	-	2	4	1	
			<i>Deileptenia rebeata</i>	-	-	1	-	-	-	-	-	-	
			<i>Dilophodes parvularia</i>	-	-	-	-	-	-	-	-	-	
			<i>Dindica virescens</i>	-	-	3	3	2	-	-	-	1	1
			<i>Diplodesma ussuriaria</i>	-	-	-	-	-	-	-	-	-	16
			<i>Duilophyle agitata</i>	-	-	-	-	-	-	-	-	1	-
			<i>Duilophyle majuscularia</i>	-	-	-	-	-	-	-	-	1	1
			<i>Ecliptopera umbrosaria</i>	-	-	2	-	-	-	-	-	4	1
			<i>Ectephrina semilutea</i>	-	-	-	-	-	-	-	-	-	1
			<i>Ectropis aignerii</i>	-	1	1	-	-	-	-	-	2	-
			<i>Ectropis crepuscularia</i>	-	-	-	-	-	-	-	-	-	1
			<i>Ectropis excellens</i>	3	3	3	2	2	2	-	-	4	3
			<i>Ellicrinia paryula</i>	-	-	-	-	-	-	-	-	-	1
			<i>Eupithecia tabidaria</i>	-	-	-	-	-	-	-	-	-	-
			<i>Eustroma aerosum</i>	-	-	-	-	-	-	-	-	1	-
			<i>Evecliptopera decurrens</i>	-	-	-	-	-	-	-	1	2	2
			<i>Fascellina chromataria</i>	2	2	-	-	-	-	-	-	2	1
			<i>Gandaritis agnes</i>	-	1	-	-	-	-	-	-	-	-
			<i>Gandaritis fixseni</i>	-	-	-	1	-	-	-	-	-	1
			<i>Gelasma grandifcaria</i>	-	-	-	-	-	-	-	-	-	1
			<i>Geometra dieckmanni</i>	-	-	-	-	1	-	-	-	2	1
			<i>Geometra glaucaria</i>	-	-	-	-	-	-	-	-	1	-
			<i>Gymnoscelis esakii</i>	-	-	-	-	-	-	-	-	-	1
			<i>Hemistola veneta</i>	-	-	-	-	-	-	-	-	-	2
			<i>Hemitheta aestivaria</i>	-	-	-	-	-	-	-	-	-	1
			<i>Heterolocha aristonaria</i>	-	-	-	-	-	-	-	-	5	1
			<i>Heterolocha laminaria</i>	-	1	1	1	-	-	-	-	-	1
			<i>Heterostegane hyriaria</i>	-	-	-	-	-	-	-	-	2	3
			<i>Hypephyra terrosa</i>	-	-	-	-	-	-	-	-	2	1
			<i>Hyperapeira parva</i>	-	-	-	-	-	-	-	-	-	1
			<i>Hypomecis punctinalis</i>	-	1	-	-	-	-	-	-	1	3
			<i>Hypomecis roboraria</i>	-	-	-	-	-	-	-	1	3	1
			<i>Idea auricruda</i>	-	-	-	-	-	-	-	-	-	1
<i>Idea muricata</i>	-	-	-	-	-	-	-	-	2	1			
<i>Idea nielsenii</i>	-	-	-	-	-	-	-	-	1	-			
<i>Idiotephria amella</i>	-	-	-	-	-	-	-	-	-	1			
<i>Jankowskia fuscaria</i>	-	-	-	-	-	-	-	-	-	1			
<i>Jankowskia pseudathleta</i>	-	1	-	-	-	1	-	-	4	3			
<i>Jodis angulata</i>	-	-	-	-	-	-	-	-	-	1			
<i>Jodis putata</i>	-	-	-	-	-	-	-	-	-	1			
<i>Leptostegna tenerata</i>	-	-	-	-	-	-	-	-	2	-			
<i>Lomographa subsersata</i>	-	1	-	-	-	-	1	-	-	-			

Appendix 1. Continued

Families	Scientific name	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
		S1	S2	S3	S4	S5	S6		
Geometridae	자나방과								
	<i>Menophra senilis</i>	3	2	1	2	2	1	3	5
	<i>Microcalcarifera obscura</i>	-	-	-	-	-	-	-	1
	<i>Microlygris complicata</i>	-	-	-	-	-	-	1	1
	<i>Neohipparchus vallata</i>	-	-	-	-	-	-	-	1
	<i>Ninodes splendens</i>	-	-	-	-	-	-	-	2
	<i>Nothomiza aureolaria</i>	-	-	-	-	-	-	1	-
	<i>Obeidia tigrata</i>	-	-	-	-	-	-	1	-
	<i>Ochrognesia diffracta</i>	-	-	1	-	-	-	3	-
	<i>Odontopera arida</i>	-	-	-	-	-	-	-	1
	<i>Ophthalmitis albosignaria</i>	-	1	1	-	-	1	3	5
	<i>Ourapteryx maculicaudaria</i>	-	-	-	-	-	-	1	-
	<i>Ourapteryx nivea</i>	3	1	1	1	1	-	2	2
	<i>Ourapteryx persica</i>	-	-	-	-	-	-	1	3
	<i>Pachyligia dolosa</i>	-	-	-	-	-	-	-	1
	<i>Parabapta clarissa</i>	-	-	-	-	-	-	-	2
	<i>Pareclipsis gracilis</i>	4	-	-	1	1	-	2	1
	<i>Parectropis extersaria</i>	1	-	-	-	-	-	-	-
	<i>Percnia albinigrata</i>	-	-	-	-	-	-	1	1
	<i>Phthonosema tendinosaria</i>	3	2	1	-	-	1	3	-
	<i>Pingasa pseudoterpnaria</i>	-	-	-	-	-	-	-	1
	<i>Plagodis pulveraria</i>	-	3	-	3	-	-	4	4
	<i>Pogonopygia nigralbata</i>	-	-	-	-	-	-	-	1
	<i>Polymixinia appositaria</i>	1	-	2	-	-	-	-	3
	<i>Problepsis diazoma</i>	-	-	-	-	-	-	1	-
	<i>Problepsis eucircota</i>	-	-	-	-	-	-	-	1
	<i>Problepsis plagiata</i>	1	-	-	-	-	-	-	1
	<i>Problepsis superans</i>	-	-	-	-	-	-	1	-
	<i>Protoboarmia simplicifaria</i>	-	-	-	-	-	-	-	1
	<i>Pylargosceles steganioides</i>	-	-	-	-	-	-	1	1
	<i>Racotis boarmia</i>	-	-	-	-	-	-	-	1
	<i>Racotis petrosa</i>	-	-	-	-	-	-	-	2
	<i>Rikiosatoa grisea</i>	-	-	-	-	-	-	1	-
	<i>Scopula emissaria</i>	-	-	-	-	-	-	1	-
	<i>Scopula floslactata</i>	-	-	-	-	-	-	-	1
	<i>Scopula ignobilis</i>	-	-	1	-	-	-	-	-
	<i>Scopula nigropunctata</i>	-	-	-	-	-	-	2	5
	<i>Scopula semiignobilis</i>	-	-	-	-	-	-	-	1
	<i>Scopula superior</i>	-	-	-	-	-	-	-	1
	<i>Somatina indicataria</i>	-	-	-	-	-	-	3	1
	<i>Tanaorhinus reciprocata</i>	-	-	-	-	-	-	1	1
	<i>Teprhina vapulata</i>	-	-	-	-	-	-	-	2
	<i>Thetidia albocostaria</i>	-	-	-	-	-	-	-	3

Appendix 1. Continued

Families	Scientific name	2016										2012 ^{a,b,c,d,e,f}		2005 ^g		
		S1	S2	S3	S4	S5	S6									
Geometridae	자나방과	Species	<i>Thinopteryx crocoptera</i>	-	-	-	-	-	-	-	1	1	-	-	1	
			<i>Timandra apicirosea</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Timandra comptaria</i>	-	1	-	-	-	-	-	-	-	-	-	4	1
			<i>Timandra dicheta</i>	-	-	-	-	-	-	-	-	-	-	-	2	1
			<i>Timandra griseata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Xandrames dholaria</i>	-	-	-	-	-	-	-	-	-	-	-	1	1
			<i>Xanthorhoe hortensiaria</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
			<i>Xanthorhoe saturata</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
			<i>Zancliclia testacea</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Clostera anachoreta</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Clostera anastometa</i>	-	-	2	-	-	-	-	-	-	-	-	-	1
			<i>Drymonia dodonides</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Dudusa sphigiformis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Eguria ornata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
			<i>Fentonia ocypete</i>	-	2	3	2	2	2	-	-	-	-	-	4	8
			<i>Gangarides dharma</i>	-	1	-	-	-	-	-	-	-	-	-	-	3
			<i>Harpylia umbrosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Hexafrenum leucodera</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Lophontosis cuculus</i>	-	-	-	-	-	-	-	-	-	-	-	-	4			
<i>Narracoides basinotata</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			
<i>Neodrymonia coreana</i>	-	-	-	-	-	-	-	-	-	-	-	-	16			
<i>Neodrymonia marginalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Neostauroopus basalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	4			
<i>Nerice davidi</i>	-	-	-	-	-	-	-	-	-	-	-	-	3			
<i>Peridea elzet</i>	-	1	1	1	-	1	1	1	1	1	1	1	1			
<i>Peridea gigantea</i>	-	-	2	-	-	3	-	-	-	-	-	-	-			
<i>Peridea lativitta</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			
<i>Peridea oberthueri</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Phalera assimilis</i>	-	-	2	2	2	4	4	4	4	4	4	4	4			
<i>Phalera flavescens</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Phalera minor</i>	-	4	2	-	-	-	-	-	-	-	-	-	-			
<i>Phalera sangana</i>	-	-	-	1	-	-	-	-	-	-	-	-	3			
<i>Pterostoma sinicum</i>	-	-	1	-	-	1	1	1	1	1	1	1	1			
<i>Quadricalcarifera cyanea</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			
<i>Quadricalcarifera pryeri</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Quadricalcarifera subgeneris</i>	-	-	1	-	-	-	-	-	-	-	-	-	5			
<i>Rabata cristata</i>	-	2	2	3	2	2	2	2	2	2	2	2	2			
<i>Spatalia doerriesi</i>	-	-	2	2	-	-	-	-	-	-	-	-	3			
<i>Uropyla meticolodina</i>	-	-	1	-	-	-	-	-	-	-	-	-	1			
<i>Wilemanus bidentatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Epicopeia menciana</i>	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Eumeta japonica</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			
<i>Eumeta minuscula</i>	-	-	-	-	-	-	-	-	-	-	-	-	2			

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
			S1	S2	S3	S4	S5	S6		
Yponomeutidae		<i>Yponomeuta tokyonellus</i>	-	-	-	-	-	-	42	
	집나방과	<i>Ypsolopha blandellus</i>	-	-	-	-	-	-	2	
		<i>Ypsolopha strigosus</i>	-	-	-	-	-	1	-	
Thyrididae	창나방과	<i>Rhodoneura erecta</i>	-	-	-	-	1	-	-	
		<i>Rhodoneura shini</i>	2	1	-	-	-	-	-	
		<i>Rhodoneura vittula</i>	-	1	-	-	-	1	1	
		<i>Striglina cancellata</i>	-	1	-	-	-	3	3	
		<i>Striglina venia</i>	1	1	-	-	-	-	4	
Crambidae	포충나방과	<i>Agrotera nemoralis</i>	-	-	-	-	-	6	1	
		<i>Analthes maculalis</i>	-	-	-	1	-	-	-	
		<i>Analthes semitritalis</i>	-	-	-	-	-	1	-	
		<i>Anania verbascalis</i>	-	-	-	-	-	-	-	
		<i>Ancylolomia japonica</i>	-	2	1	-	-	6	1	
		<i>Botyodes aptalis</i>	-	-	-	-	-	1	1	
		<i>Botyodes diniasalis</i>	-	-	-	-	-	1	1	
		<i>Botyodes principalis</i>	-	-	-	-	-	1	1	
		<i>Bradina atopalis</i>	1	-	1	-	-	-	-	
		<i>Bradina geminalis</i>	11	7	8	6	6	5	1	
		<i>Calamotropha okanoi</i>	-	-	-	-	-	-	1	
		<i>Calamotropha paludella</i>	-	-	-	-	-	2	-	
		<i>Chabula onychinalis</i>	-	-	1	-	-	-	-	
		<i>Chabula telphusalis</i>	-	-	-	-	-	-	1	
		<i>Chilo suppressalis</i>	-	-	-	-	-	-	1	
		<i>Girrhochrista brizoalis</i>	-	-	1	-	-	-	-	
		<i>Cnaphalocrocis stereogona</i>	-	-	-	-	-	-	1	
		<i>Conogethes punctiferalis</i>	-	2	-	-	-	2	5	
		<i>Cotachena alysoni</i>	-	-	-	-	-	1	6	
		<i>Cotachena pubescens</i>	-	-	-	-	-	-	-	
		<i>Diasemia accalis</i>	-	-	-	-	-	4	-	
		<i>Elophila (Cyrtoگرامme) turbata</i>	-	-	-	-	-	1	1	
		<i>Elophila (Elophila) interruptalis</i>	-	-	-	-	-	2	1	
		<i>Eurrhyarodes accessalis</i>	-	-	1	-	1	5	-	
		<i>Eurrhyarodes contortalis</i>	4	-	-	-	-	-	-	
		<i>Glyphodes perspectalis</i>	2	-	-	-	-	3	1	
		<i>Glyphodes pryeri</i>	-	-	-	-	-	1	-	
		<i>Glyphodes quadrimaculalis</i>	-	-	-	-	-	3	1	
		<i>Goniorhynchus butyrosa</i>	-	-	-	-	1	1	-	
		<i>Goniorhynchus exemplaris</i>	-	-	-	-	-	3	11	
		<i>Haritalodes derogata</i>	2	-	-	-	-	-	1	
		<i>Herpetogramma fuscescens</i>	-	1	-	-	-	1	-	
		<i>Herpetogramma luctuosalis</i>	5	3	2	-	-	6	11	

Appendix 1. Continued

Families	Scientific name	Species	2016						2012 ^{a,b,c,d,e,f}	2005 ^g
			S1	S2	S3	S4	S5	S6		
Crambidae	포충나방과	<i>Herpetogramma rudis</i>	-	-	-	-	-	-	-	1
		<i>Metaeuchrominus flavofascialis</i>	-	-	-	-	-	-	-	1
		<i>Miyakea expansa</i>	-	-	-	-	1	-	-	1
		<i>Mutuuraia terrealis</i>	-	-	-	-	-	-	-	1
		<i>Nacoleia commixta</i>	-	1	1	2	-	-	-	-
		<i>Nacoleia sibirialis</i>	-	-	1	-	-	-	-	-
		<i>Normophila noctuella</i>	-	-	-	-	-	-	-	1
		<i>Nymphicula saigusai</i>	-	-	-	-	-	-	-	1
		<i>Omiodes noctescens</i>	-	1	-	-	-	-	-	1
		<i>Omiodes tristrialis</i>	-	-	-	-	-	-	-	-
		<i>Ostrinia furnacalis</i>	-	-	-	-	-	-	-	1
		<i>Ostrinia orientalis</i>	-	-	-	-	-	-	-	7
		<i>Ostrinia palustralis memnialis</i>	-	-	-	-	-	-	-	1
		<i>Ostrinia scapularis</i>	-	-	-	-	-	-	-	1
		<i>Ostrinia zaguliaevi</i>	-	-	-	-	-	-	-	1
		<i>Paliga auratalis</i>	-	-	1	-	-	-	-	1
		<i>Palpita inusitata</i>	-	-	-	-	-	-	-	1
		<i>Palpita nigropunctalis</i>	3	-	3	-	3	2	-	4
		<i>Parapotnx vittalis</i>	-	-	-	-	-	-	-	4
		<i>Patissa fulvosparsa</i>	-	-	-	-	-	-	-	1
		<i>Piletocera sodalis</i>	2	3	-	-	-	-	-	3
		<i>Pleuroptya baiteaya</i>	-	-	-	-	-	-	-	-
		<i>Pleuroptya chlorophanta</i>	6	3	3	3	3	2	-	1
		<i>Pleuroptya harutai</i>	-	-	-	-	-	-	-	1
		<i>Pleuroptya punctimarginalis</i>	-	-	-	-	-	-	-	-
		<i>Pleuroptya quadrimaculalis</i>	-	2	3	2	2	2	-	1
		<i>Polythlipta liquidalis</i>	-	-	-	-	-	-	-	2
		<i>Pseudargyria interruptella</i>	-	-	-	-	-	-	-	1
		<i>Pseudocatharylla simplex</i>	-	-	-	-	-	-	-	1
		<i>Pycnarmon cribrata</i>	-	-	-	-	-	-	-	1
		<i>Pycnarmon pantherata</i>	-	-	-	-	-	-	-	1
		<i>Pycnarmon tylostegalis</i>	1	-	-	-	-	-	1	-
		<i>Pygospila tyres</i>	-	-	-	-	-	-	-	-
		<i>Pyrausta mutuurai</i>	-	-	-	-	-	-	-	-
<i>Pyrausta unipunctata</i>	-	-	-	-	-	-	-	1		
<i>Rehimena phrynealis</i>	-	-	-	-	-	-	-	5		
<i>Rehimena surusalis</i>	-	1	-	-	-	-	-	2		
<i>Scirpophaga virginia</i>	-	-	-	-	-	-	-	-		
<i>Sinomphisa plagialis</i>	1	-	-	-	-	-	-	-		
<i>Sitochroa recurvalis</i>	-	-	-	-	-	-	-	6		

Appendix 1. Continued

Families	Scientific name	2016										2012 ^{a,b,c,d,e,f}	2005 ^g		
		S1	S2	S3	S4	S5	S6								
Crambidae	포충나방과	Species													
			<i>Syllepte invalidalis</i>	연무늬들명나방	-	-	-	-	-	-	-	-	-	-	2
			<i>Syllepte pallidnotalis</i>	연무늬들명나방	-	-	-	-	-	-	-	-	-	-	2
			<i>Syllepte segnalis</i>	달무늬들명나방	-	-	-	-	-	-	-	-	-	-	1
			<i>Syllepte taiwanalis</i>	대만들명나방	-	-	-	-	-	-	-	-	-	-	-
			<i>Tyspanodes hypsalis</i>	줄검은들명나방	3	3	3	4	-	-	-	-	-	-	3
Nolidae	혹나방과	Species	<i>Tyspanodes striata</i>	꽃날개들명나방	3	3	-	-	-	-	-	-	-	-	
			<i>Mimrastria mandschuriana</i>	사과혹나방	-	-	-	-	-	-	-	-	-	-	1

S1, Geubchisan; S2, Jiryeoksan; S3, Cheondungsan; S4, Cheomchalsan-1; S5, Cheomchalsan-2; S6, Godusan.
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^bNational Institute of Environmental Research, 2012b. The 3rd National Ecosystem Survey-Jinjo (346101) [CD-Rom] (in Korean).
^cNational Institute of Environmental Research, 2012c. The 3rd National Ecosystem Survey-Jisan (346092) [CD-Rom] (in Korean).
^dNational Institute of Environmental Research, 2012d. The 3rd National Ecosystem Survey-Munnae (346063) [CD-Rom] (in Korean).
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^gSohn et al., 2005. A faunistic study of Lepidoptera (Insecta) in Is. Jin-do, Korea. The Korean Journal of Systematic Zoology, Special Issue No. 5:81-104.