金 鎭 一 敎授指導

碩士學位 請求論文

韓國産 호리비단벌레屬(딱정벌레目 : 비단벌레科 : 호리비단벌레亞科)의 分類學的 硏究

Taxonomic study of the genus *Agrilus* (Coleoptera: Buprestidae: Agrilinae) in Korea

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2007年 **5**月

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認 准 書

李俊求의 碩士學位 論文으로 認准함

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논문개요

한국산 호리비단벌레속(딱정벌레목 : 비단벌레과 : 호리비단벌레아과)을 분류학적으로 검토하였다. 한국산 호리비단벌레속은 Muramatsu (1924)에 의해 처음으로 1종이 기록된 이후, 현재까지 각종 문헌을 통해 모두 47종 4아종이 보고되었다. 그러나 한국산 호리비단벌레속을 분류하고 분포상을 밝히는데 필요한 검색표와 생물학적 정보가 부재하였을 뿐 아니라 학명의 적용과 종의 실제여부 등 분류학적으로 수정되거나 개정될 사항이 적지 않았다. 이에 따라 각 대학과 연구기관 등에 소장된 호리비단벌레속의 표본 약 1,500여 개체에서 형태적 형질을 비교분석 하여 각 종명의 타당성 여부를 검토하였다.

연구결과 기존 발표종 가운데 42종은 타당성을 가진 종명이었고, 새로이 9종 1아종을 한국 미기록으로 밝혀 한국산 호리비단벌레속을 총 51종 1아종으로 정리하였으며, 새로이 추가된 한국 미기록 9종 1아종은 다음과 같다.

1. *Agrilus* (s. str.) *viduus subviduus* Y. Kurosawa, 1957
2. *A*. (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956
3. *A*. (*D*.) *cyanescens* Ratzeburg, 1837
4. *A*. (*Quercuagrilus*) *fissus* Obenberger, 1917
5. *A*. (*Q*.) *marginicollis* E. Saunders, 1873
6. *A*. (*Q*.) *varius* Kerremans, 1895.
7. *A*. (*Uragrilus*) *rokuyai* Y. Kurosawa, 1976
8. *A*. (*U*.) *tokyoensis* Y. Kurosawa, 1963

9. *A. daimio* Obenberger, 1936

10. *A. plasoni* Obenbeger, 1917

연구 결과에 따라 한국산 호리비단벌레속의 종검색표를 작성하였고 종별 형태적 특징, 문헌기록, 채집지와 생물학적 정보 등을 체계적으로 정리, 수록하였다.

목 차

I. 서 론

호리비단벌레속(*Agrilus*)은 딱정벌레목(Coleoptera), 비단벌레과(Buprestidae), 호리비단벌레아과(Agrilinae)에 속하는 분류군이며 전 세계적으로 36아속(Bellamy 2003; Jendek 2006a, b), 약 2,500-2,700여종이 알려져 있는 동물계를 통틀어 가장 큰 속이다(Bílý 2002; Bernhard et al. 2005).

호리비단벌레속은 남극대륙과 태평양의 일부 해양성 섬들을 제외한 전 세계 각지에 고르게 분포하며(Bellamy 1996), 구북구에는 413종(23아속 124종과 아속불명 289종)이 보고되어 있다(Jendek 2006b, c).

호리비단벌레속의 성충은 크기가 3.0-16.0 mm 정도이며, 일반적으로 몸은 가늘고 길며, 반원통형으로 대개 금속성의 광택을 띤다. 구기는 하구식이며, 큰턱은 매우 경화되어 있고 내연에는 날카로운 돌기들이 존재한다. 겹눈은 달걀 또는 콩팥모양으로 매우 크고 돌출되어 있다. 더듬이는 짧으며 모두 11마디로 이루어져 있고 일반적으로 4번째 마디부터 드물게는 5번째 또는 6번째 마디부터 톱니모양이다. 앞가슴등판은 보통 길이에 비해 폭이 넓고 다소 위로 볼록하며, 일반적으로 후각에 내측융선(prehumeral carinae)이 존재하지만 드물게는 완전히 소실되기도 한다. 측면에는 명확한 측융선(marginal carinae)과 아측융선(submarginal carinae)이 존재하며, 이는 근연속들과 구별되는 주요 특징이 된다. 소순판은 심장형이며, 일반적으로 가로융선이 존재하나 드물게 완전히 소실되기도 한다. 딱지날개는 가늘고 길며, 일반적으로 복부측배판을 제외한 배 전체를 완전히 덮는다. 딱지날개끝의 형태는 매우 다양하며, 크고 작

은 거치가 발달한다. 배는 7개의 등판과 5개의 배판으로 보이며, 첫 번째 배판과 두 번째 배판은 서로 융합되어 있다. 일곱 번째 복부등판의 중앙에는 세로 융기선이 존재하며, 드물게 완전히 소실되거나 또는 복부등판의 뒷가두리 너머로 돌출하기도 한다. 복부측배판은 보통 딱지날개로 덮이지 않으며, 종종 연모가 밀집한 점무늬가 나타난다. 수컷생식기는 관상으로 길게 신장되어 있으며, 교미구는 길고 보통 창모양이며 끝강모가 발달한다. 음경의 정단부와 내낭 등의 형태는 아속을 구분하는 중요한 형질이 된다.

이들은 모두 초식성으로, 대부분의 유충은 교목이나 관목의 줄기 또는 가지의 체관부를 섭식하고, 드물게는 목질부를 섭식한다(Muskovits & Hegyessy 2002). 또한 일부 유충은 다년생 초본의 부드러운 줄기 또는 뿌리와 뿌리줄기를 섭식하는 것으로 알려져있다(Bílý 1982, 2002; Muskovits & Hegyessy 2002). 기주와의 관계는 매우 광범위하지만, 피자식물에만 한하며 나자식물에서는 알려지지 않았다(Fisher 1928; Bellamy 1996). 성충은 호일광성(heliophilous)으로, 주로 따뜻하며 햇빛이 강한 시간대에 활발하게 활동하며, 기주식물의 꽃잎 또는 잎을 갉아 먹는다(Bílý 1982, 2002). 호리비단벌레류는 일반적으로 1년에 1세대 내지 2년에 1세대를 경과하며(Muskovits & Hegyessy 2002), 대부분은 유충 또는 용의 형태로 월동하지만, 드물게 성충으로 월동하기도 한다.

호리비단벌레속의 극소수의 종(e.g. *A. hyperici*)들은 잡초의 생물학적 방제에 이용되기도 하지만(Bellamy & Nelson 2002), 대부분의 종들은 식물을 가해하여 크고 작은 피해를 주며, 식물에게 심각한 질병을 옮기는 매개자로서, 특히 삼림과 농업에 있어 주요한 해충으로 여겨진다(Bílý 2002).

국내에서는 사과나무(*Malus pumila*)의 주요한 해충인 사과호리비단벌

레(*A. mali*)에 의한 피해사례가 보고된 바 있으며(e.g. Muramatsu 1924; Nakayama & Okamoto 1940), 국외로는 체코(Czech)에서 1970년 후반부터 1980년 초반까지 도심의 공원에 식재된 *Lonicera*류가 청호리비단벌레(*A. cyanescens*)에 의해 피해를 입은 기록이 있고, 슬로바키아(Slovakia)에서는 1980년대에 구리빛호리비단벌레(*A. cuprescens*)에 의해 나무딸기류(raspberries)가 큰 피해를 입은 기록이 있다. 그 밖에도 유럽 각지에서 다양한 호리비단벌레류에 의한 피해사례가 보고된 바 있다(Bílý 2002). 최근에 북미(North America)와 캐나다(Canada)에서 심각한 문제가 되고 있는 서울호리비단벌레(*A. planipennis*)는 아시아로부터 유입된 종으로, 북미에서만 가로수로 식재된 미국물푸레나무(*Fraxinus americana*) 등을 비롯하여 약 2,000만 그루 이상의 나무를 고사시킨 기록이 있다.

호리비단벌레속은 단일 속임에도 불구하고 범세계적인 분포와 많은 종수 뿐만 아니라, 종들간의 외형적 유사성으로 인하여 분류학적 접근에 큰 어려움이 있다. Obenberger (1957, 1959)는 호리비단벌레속을 외부 형태적 형질을 이용하여 속 또는 아속으로 나누려는 시도를 하였으나 성공하지 못하였고, 일부 종 그룹만을 인정하였을 뿐이다(Carlson & Knight 1969; Alexeev 1998). Alexeev (1998)는 Obenberger가 아속을 나누지 못한 이유를 외부 형태적 형질만을 이용하였기 때문이라 지적하고, 수컷 생식기의 형태에 근거하여 구북구의 호리비단벌레속을 17개의 아속으로 정리하였다. 그러나 그는 러시아와 러시아 인접지역에 분포하는 일부 종만을 대상으로 하였으며, 구북구에 분포하는 모든 종을 다루지는 못하였다. 또한 Alexeev (1998)는 근래까지도 대부분의 연구들이 수컷생식기의 관찰이나 기재없이 외부 형태적 형질에만 의존하여 수행된 이유로 연구에 어려움을 말한 바 있다.

최근까지도 호리비단벌레속의 분류학적 연구는 대부분 국지적으로 종

기재의 수준으로 수행되었으며, 범세계적인 계통학적 연구는 없는 상황이다. 호리비단벌레속에서 아속의 취급은 최근까지도 학자들간 많은 논란이 되고 있으나(Mühle et al. 2000; Muskovits & Hegyessy 2002; Jendek 2006b), 본 연구에서는 가장 최근에 일반적으로 받아들여지는 Bellamy (2003)의 분류체계에서 일부 수정된 Jendek (2006a)에 분류체계를 적용한다. 이에 따르면 현재 36아속이 받아들여지며, 구북구에서는 23아속이, 한국에서는 11아속이 보고되어 있다. 이들 아속의 생물지리학적 분포를 요약하면 Table 1과 같다.

한국산 호리비단벌레속은 최근까지도 곤충상 보고서 등에서 드물게 게재되고 있으나, 아직까지 국내에서의 체계적인 분류연구는 이루어지지 않은 것이 사실이며, 신뢰할 수 있는 분류학적 정보의 부재로 이중에는 많은 오동정과 동물이명 및 잘못된 기록의 인용 등이 포함되어 있기 때문에 이들에 대한 재검토가 필요하였다. 이에 따라 본 연구에서 오동정과 동물이명의 정리를 통해 새로운 종 목록을 작성하고, 이들 종에 대한 신뢰할 수 있는 분류학적 정보를 제공하였다.

Table 1. Distribution of the subgenera in the genus *Agrilus* over the zoogeographical regions

Regions / Subgenera	PAR				ORR	AUS	AFR	NAR	NTR
	P1	P2	P3	P4					
Agrartus						○			
Agrilomorpha			○				○		
Agrilosambus					○				
Agrilus	○	○	○	○				○	
Agriphylus							○		
Anambus	○	○		○	○				
Aridagrilus	○	○	○						
Austragrilus				○	○				
Bubagrilus			○				○		
Convexagrilus	○		○						
Coroebilus							○		
Dentagrilus	○			○				◎	
Diplolophotus			○				○		
Duttus							○		
Engyaulus								○	○
Igagrilus					○				
Lilliput							○		
Melagrilus							○		
Micragrilus		○	○				○		
Nigriticus							○		
Orientagrilus				○					
Pinarinus						○			
Pantherina							○		
Paralophotus			○				○		
Personatus			○				○		
Pinarius						○			
Pseudoquercagrilus				○	○				
Quercuagrilus	○	○	○	○	○			○	
Robertius	○	○	○	○			○	○	
Rosagrilus	○		○						
Sinagrilus				○	○				
Sinuatiagrilus	○	○	○	○				◎	
Spiragrilus	○	○	○			◎		◎	
Uragrilus	○	○		○	○		○	○	
Xenagrilus							○		
Xeragrilus	○	○	○	○					
No. of subgenera	12	10	15	12	8	4	16	8	1

Data for the distribution of the subgenera in the genus *Agrilus* are based on Alexeev (1998), Bellamy (1996), Jendek (2006c).

Abbreviations and symbols: AUS=Australian region, AFR=Afrotropical region, NAR=Nearctic region, NTR=Neotropical region, ORR=Oriental region, PAR=Palaearctic region, P1=European subregion, P2=Siberian subregion, P3=Mediterranean subregion, P4=Manchurian subregion; ○=Native, ◎=Introduced.

II. 연구사

한국산 호리비단벌레속의 최초기록은 1924년 Muramatsu가 사과나무의 주요한 해충인 *Agrilus mali*를 생활사의 보고와 함께 신종 기재한 것이다. Obenberger는 1935년 인천 제물포에서 채집한 표본을 근거로 *A. coreanus*를 신종 기재하였고, 1940년 서울에서 채집한 표본을 근거로 *A. quadristictulus*를 신종으로 발표하였으나 이는 *A. sospes*의 동물이명이다. 1940년 Ishii는 경성공립중학교에 소장된 딱정벌레목의 목록을 보고하면서 *A. discalis*와 *A. spinipennis*를 한국 분포에 포함시켰다. Cho는 1947년 금강산의 동물상을 발표하면서 *A. spinipennis*를 보고하였는데, 이는 국내학자로서는 최초의 보고이다. Kurosawa (1954, 1956, 1963b, 1985)는 동아시아 지역의 비단벌레상을 활발히 연구하면서 *A. fleischeri coreicus*와 *A. marco-poli* 등을 비롯하여 모두 11종 1아종을 한국 분포에 추가 기록하였으나, 이중에는 많은 동물이명이 포함되어 있다(see Table 2).

이후, Cho (1967)와 Ju (1969)등 을 비롯한 일부 국내외 연구자들에 의해 지역 곤충상 조사과정 등을 통해 최근까지도 단편적으로나마 꾸준히 국내 분포지가 추가 기록되었으나 아직까지 체계적인 분류연구는 수행되지 못한 실정이다.

최근에 Jendek (2006c)이 구북구의 호리비단벌레속의 목록을 발표하면서 3종(*A. euonymi*, *A. delphinensis*, *A. viduus chiganicus*)을 한국 분포에 추가하여, 2007년 현재까지 미동정으로 처리된 것은 배제하고 한국산으로 기록된 학명은 모두 47종 4아종이며, 이를 발표 연도 순으로 정리하면 Table 2와 같다.

Table 2. The historical review of the Korean *Agrilus* species

Year	Authors	added	suvived	Reported names	Status of names	Current names
1924	Muramatsu	1	1	*Agrilus mali*		***Agrilus mali***
1935	Obenberger	1	1	*Agrilus coreanus*		***Agrilus coreanus***
1940	Ishii	2	2	*Agrilus discalis*		***Agrilus discalis***
				Agrilus spinipnnis	mssp.	***Agrilus spinipennis***
1940	Obenberger	1	1	*Agrilus quadristictulus*	syn.	***Agrilus sospes***
1954	Kurosawa	1	1	*Agrilus fleischeri coreicus*	syn.	***Agrilus fleischeri***
1956	Kurosawa	1	1	*Agrilus marco-poli*	syn.	***Agrilus planipennis***
1963	Kurosawa	10	8	*Agrilus asiaticus*		***Agrilus asiaticus***
				Agrilus cyaneoniger		***Agrilus cyaneoniger***
				Agrilus fleischeri		*Agrilus fleischeri*
				Agrilus friebi		***Agrilus friebi***
				Agrilus lasiolus	syn.	***Agrilus ussuricola***
				Agrilus rotundicollis	syn.	***Agrilus moerens***
				Agrilus sospes		*Agrilus sospes*
				Agrilus subrobustus		***Agrilus subrobustus***
				Agrilus suvorovi		***Agrilus suvorovi***
				Agrilus tibialis		***Agrilus ribbei***
1967	Cho	2	1	*Agrilus lewisiellus*	syn.	*Agrilus ribbei*
				Agrilus tempestivus		***Agrilus tempestivus***
1969	Ju	1	0	*Agrilus planefasciatus*	syn.	*Agrilus asiaticus*
1971	Kim et al.	1	1	*Agrilus alazon*	stat.	***Agrilus decoloratus alazon***
1971	Kim & Kim	1	1	*Agrilus ronino*	syn.	***Agrilus komareki***
1972	Kim & Kim	1	1	*Agrilus yamawakii*		***Agrilus yamawakii***
1974	Kim et al.	1	0	*Agrilus cyaneoniger mikado*	syn.	*Agrilus cyaneoniger*
1985	Kurosawa	1	1	*Agrilus chujoi*		***Agrilus chujoi***
1985	Tôyama	2	2	*Agrilus viridis*		***Agrilus viridis***
				Agrilus insuspectus	syn.	***Agrilus sibiricus***

Table. 2. (Continued)

Year	Authors	added	suvived	Reported names	Status of names	Current names
				Agrilus ater		***Agrilus ater***
				Agrilus cuprescens		***Agrilus cuprescens***
				Agrilus ecarinatus		***Agrilus ecarinatus***
				Agrilus pekinensis		***Agrilus pekinensis***
				Agrilus peregrinus		***Agrilus peregrinus***
				Agrilus pooli		***Agrilus pooli***
				Agrilus pseudocyaneus		***Agrilus pseudocyaneus***
1998	Alexeev	14	12	*Agrilus ribesi*		***Agrilus ribesi***
				Agrilus smaragdinus		***Agrilus smaragdinus***
				Agrilus soudeki		***Agrilus soudeki***
				Agrilus subauratus amurensis		***Agrilus subauratus amurensis***
				Agrilus vernadskii	syn.	*Agrilus viridis*
				Agrilus vladivostokanus	syn.	*Agrilus moerens*
				Agrilus quadrisignatus		***Agrilus quadrisignatus***
1989	Tôyama	1	0	*Agrilus cyaneoniger melanopterus*	syn.	*Agrilus cyaneoniger*
1993	Park et al.	1	1	*Agrilus imitans*		***Agrilus imitans***
1994	Jendek	2	1	*Agrilus adelphinus*		***Agrilus adelphinus***
				Agrilus tibialis corax	syn.	*Agrilus ribbei*
1997	Akiyama & Ohmomo	2	2	*Agrilus nicolanus*		***Agrilus nicolanus***
				Agrilus salicivola		***Agrilus salicivola***
1997	Kim & Kim			*Agrilus toyamai*	syn.	***Agrilus ventricosus***
				Agrilus euonymi		***Agrilus euonymi***
2006	Jendek	3	3	*Agrilus delphinensis*		***Agrilus delphinensis***
				Agrilus viduus chiganicus		***Agrilus viduus chiganicus***
	Total	**47(+4)**	**42**	**Bold face: valid name**		

III. 재료 및 방법

1. 표본의 수집과 확인

본 연구에 사용된 표본은 경상대학교 생물학과, 고려대학교 부설 한국곤충연구소, 국립중앙과학관, 농업과학기술원 농업생물부 농업해충과 및 유용곤충과, 서울대학교 응용생물화학부, 성신여자대학교 생물학과, 영남대학교 생물학과, 이화여자대학교 자연사박물관, 충남대학교 생물학과 및 일부 개인수집가들의 소장표본들과 2004년 6월부터 2007년 5월까지 본인이 채집한 표본 등 약 1,500여 개체를 대상으로 하였다. 또한 국외로부터 호리비단벌레속의 증거표본(voucher) 23종 51개체를 입수하여 국내종과 비교하였다(Table 3).

2. 표본의 채집과 제작

채집은 2004년 7월부터 2007년 5월까지 주로 성충만을 대상으로 기주특이성을 고려하여 주간에 보고잡기와 포충망(sweeping net: ∅45cm)을 이용한 채어잡기와 쓸어잡기, 또는 비팅시트(bitting sheet: 68cm × 68cm)을 이용한 털어잡기의 방법 등을 실시하였으며, 일부는 말레이즈트랩(malaise trap)과 비행간섭트랩(FIT: flight intercept trap)으로 채집되었다. 채집한 표본들은 주로 건조표본으로 제작하였고, 일부는 95% 에틸알코올(ethly alcohol)에 넣어 액침 보관하였다.

Table 3. Voucher specimens of the genus *Agrilus*

Species	No. of specimens	Determination
Agrilus asahinai Y. Kurosawa	1♂1♀	Dr. E. Jendek (Slovakia)
Agrilus cyanescens Ratzeburg	1♂1♀	
Agrilus daimio Obenberger	1♂1♀	
Agrilus ecarinatus Marseul	1♂1♀	
Agrilus euonymi Tôyama	1♂1♀	
Agrilus fissus Obenberger	1♂1♀	
Agrilus friebi Obenberger	1♂1♀	
Agrilus mali Muramatsu	1♂1♀	
Agrilus marginicollis E. Saunders	1♂1♀	
Agrilus peregrinus Obenberger	2♂2♀	
Agrilus smaragidunus Solsky	2♂2♀	
Agrilus varius Kerremans	1♂1♀	
Agrilus viduus subviduus Kerremans	1♂1♀	
Agrilus yamawakii Y. Kurosawa	1♂1♀	
Agrilus cyaneoniger E. Saunders	1♂1♀	Mr. T. Hattori (Japan)
Agrilus sospes Lewis	1♂1♀	
Agrilus tempestivus Lewis	1♂1♀	
Agrilus planipennis Fairmaire	2♂2♀	Dr. D. W. Williams (U.S.A.)
Agrilus asiaticus Kerremans	1♂	Dr. I. N. Osipov (Russia)
Agrilus ater (Linnaeus)	1♂	
Agrilus ribbei Kiesenwetter	2♂	
Agrilus smaragdinus Solsky	1♂	
Agrilus suvorovi Obenberger	2♀	
Agrilus viridis (Linnaeus)	2♀	
Total 23 species	**51 exs.**	

3. 형태 관찰 및 용어

표본의 외형관찰은 해부현미경(LEICA MZ APO, OLYMPUS SZ40)을 사용하였으며, 표면에 묻어 있는 먼지 등으로 인해 관찰이 용의치 않은 표본은 초음파세척기(NEXUL NXP1002)를 이용하여 증류수에 1-15초간 세척한 뒤 실온에서 건조한 후 관찰하였다.

수컷의 외부생식기의 관찰 준비는 건조 또는 액침 표본을 70-80℃ 증류수에 약 15분간 담궈 연화시킨 후 복부마디 끝의 등판과 복판 사이를 초정밀핀셋을 이용하여 벌려 꺼낸 후, 10% 수산화칼륨(KOH)에 약 15분간 중탕 가열하여 내부조직을 제거하고, 95% 에틸알코올(ethly alcohol)에 넣어 해부 및 세척하였다. 수컷 외부생식기의 관찰은 해부현미경(LEICA MZAPO, OLYMPUS SZ40)하에서 실시하였으며, 관찰 후에는 글리세린(glycerin)을 넣은 생식기보관용 관병에 넣어 해당 표본과 함께 곤충핀으로 고정하여 보관하였다.

표본의 각 부위의 크기 측정은 해부현미경하에서 ocular grid를 이용하여 측정하였으며, 측정 표본의 수는 암수 각각 5개체씩을 사용함을 기준으로 하였으나, 개체수가 확보되지 않은 경우 해당종의 보유한 표본 전부를 측정하여 최대최소값과 평균값을 취하였다.

외부형태사진은 디지털카메라(NIKON D70S)에 접사렌즈(NIKON AF 105mm MICRO F2.8D)를 장착하여 촬영하였다.

각 부위의 명칭은 학자들 간에 다소 차이가 있으며, 본 연구에서는 Bílý (1982), Kolibáč (2000) 그리고 Jendek (2001a) 등을 참고하였다 (Figure 2, 3). 우리말 곤충 용어는 응용곤충학회와 한국곤충학회(1998)의 「곤충 용어집」을, 채색은 (재)한국색채연구소 (2006)의 「우리말 색이름 사전」을 따랐다. 한국 식물명은 이우철 (1996)의 「한국식물명고」

를 따랐으며, 국내에 분포하지 않는 식물의 경우 인용문헌으로부터 학명을 그대로 사용하였다. 한글 지명의 영문표기법은 문화관광부 국립국어연구원(2000)의 「로마자 표기 용례 사전」을 따랐으며, 관찰표본은 각 도별로 구분하였고, 서울이나 부산 등과 같이 행정상 도와 분리되어 독립되어 있는 특별시나 광역시의 경우에는 경기도와 경상남도로 각각 소속시켰으며, 이는 행정구역과는 무관하게 분포지역을 편리하게 나타내기 위함이며, 각 도별 약어는 Figure 1과 같다. 각 종의 모식표본 소장지의 약어는 (Table 4)와 같다.

Table 4. Acronyms and names used for type depositories

Acronym	Name	Country
MNHN	Muséum national d'Histoire naturelle, Paris	France
MNHU	Museum für Naturkunde der Humbolt-Universität, Berlin	Germany
NHM	The Natural History Museum, London	England
NMP	Národní muzeum, Prague	Czech
NSMT	National Science Museum, Tokyo	Japan
ZIN	Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia	Russia
ZSM	Zoologische Staatssammlung München	Germany

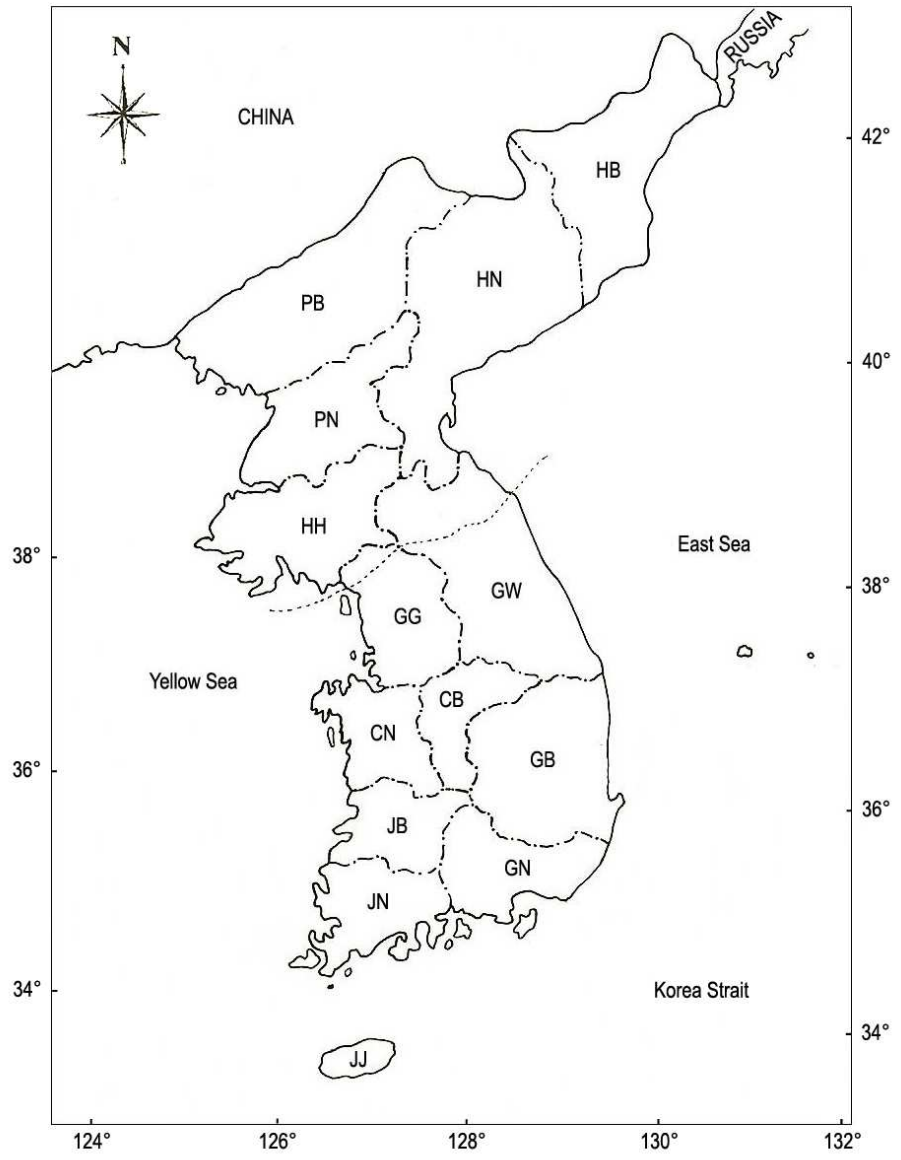

Figure 1. Provincial map of the Korean Peninsula. Abbreviations: HB=Hamgyeongbuk-do, HN=Hamgyeongnam-do, PB=Pyeonganbuk-do, PN=Pyeongannam-do, HH=Hwanghae-do, GW=Gangwon-do, GG=Gyeonggi-do, CB=Chungcheongbuk-do, CN=Chungcheongnam-do, JB=Jeollabuk-do, JN=Jeollanam-do, GN=Gyeongsangbuk-do, GB=Gyeongsangnam-do, JJ=Jeju-do.

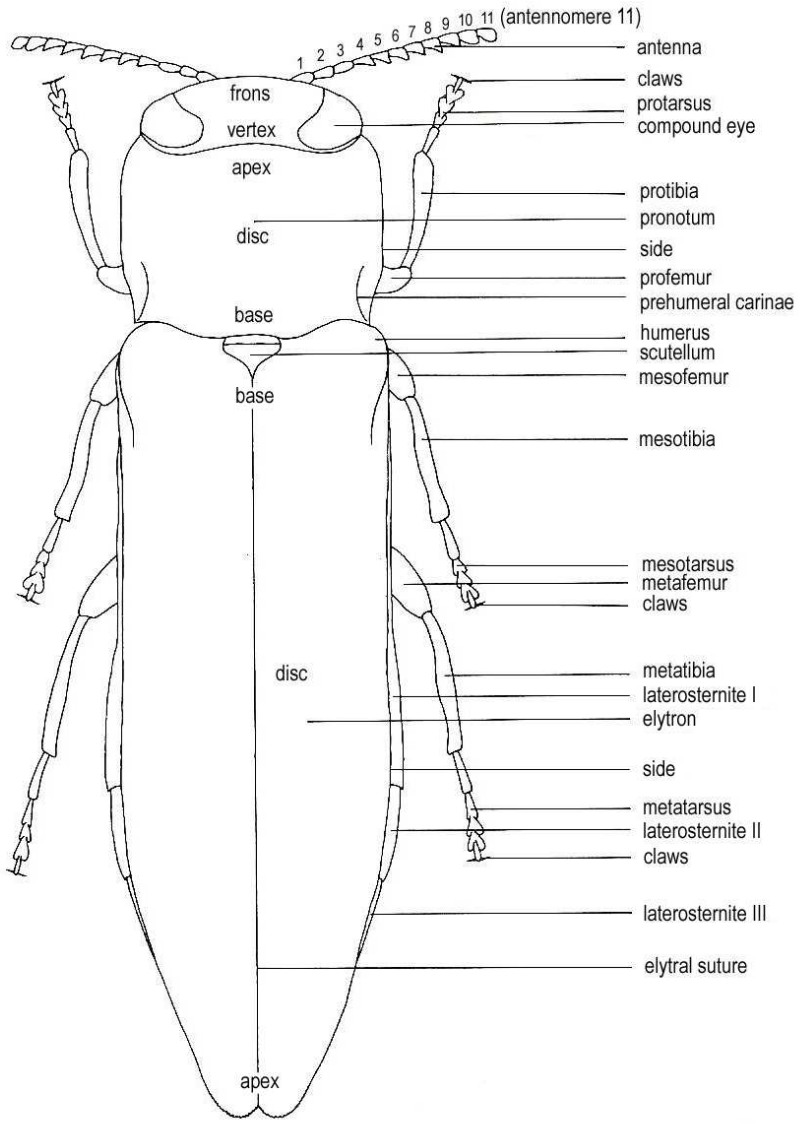

Figure 2. Morphology of the *Agrilus*, dorsal view (modified from Bílý 1982).

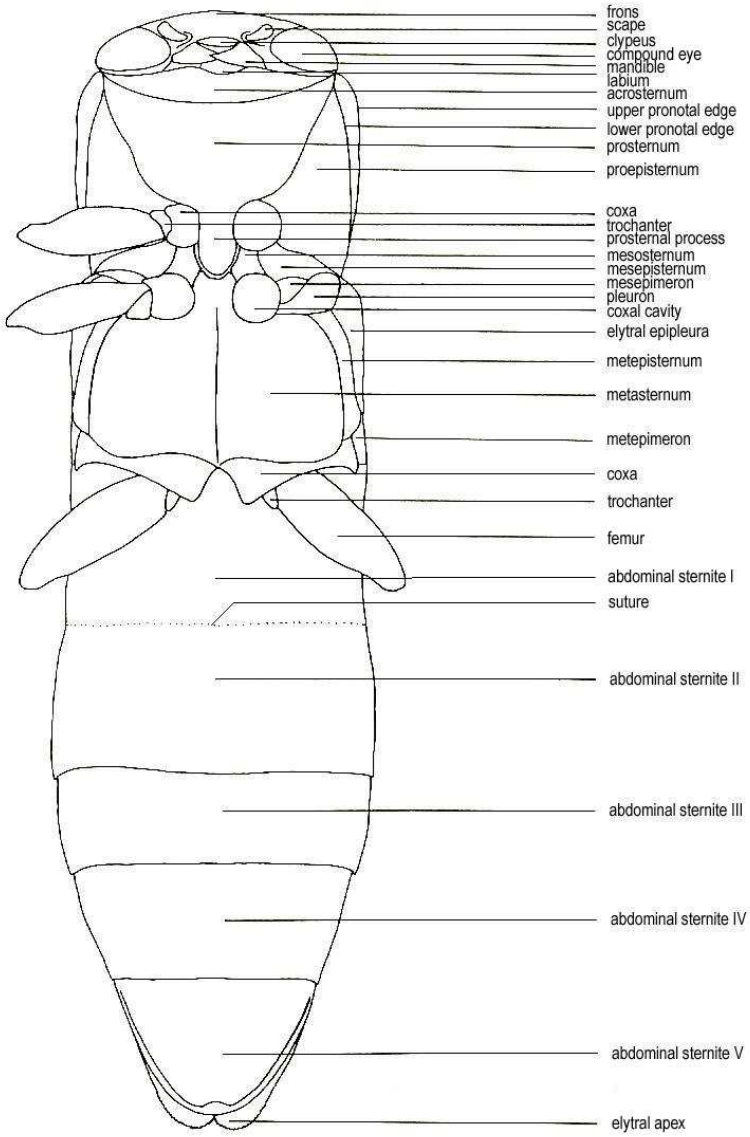

Figure 3. Morphology of the *Agrilus*, ventral view (modified from Bílý 1982).

IV. 결과 및 고찰

1. 한국산 호리비단벌레속의 목록

2007년 5월까지 각종 문헌상으로 기록된 한국산 호리비단벌레속은 모두 47종 4아종이었으며 그 중 42종만 유효성이 인정되었고, 새로이 한국 미기록 9종 1아종을 추가하여 한국산 호리비단벌레속을 총 51종 1아종으로 정리하였다. 이 가운데 문헌상의 기록은 있으나 한국산 표본을 확인하지 못한 종은 11종 1아종이다(Table 5).

Table 5. Check list of the genus *Agrilus* in Korea

Genus *Agrilus* Curtis, 1825	
Species incertae sedis, genus *Agrilus*	
1. *Agrilus chujoi* Y. Kurosawa, 1985	
2. *Agrilus daimio* Obenberger, 1936	+
3. *Agrilus decoloratus alazon* Lewis, 1893	
4. *Agrilus discalis* E. Saunders, 1873	
5. *Agrilus euonymi* Tôyama, 1985	
6. *Agrilus imitans* Lewis, 1893	
7. *Agrilus plasoni* Obenberger, 1917	+
8. *Agrilus quadrisignatus* Marseul, 1866	−
9. *Agrilus sospes* Lewis, 1893	
10. *Agrilus spinipennis* Lewis, 1893	
11. *Agrilus subrobustus* E. Saunders, 1873	
12. *Agrilus ventricosus* Fairmaire, 1888	
13. *Agrilus yamawakii* Y. Kurosawa, 1957	

Table 5. (Continued)

Subgenus *Agrilus* Curtis, 1825	
14. *Agrilus* (s. str.) *cuprescens* (Ménétriés, 1832)	−
15. *Agrilus* (s. str.) *ribesi* Schaefer, 1946	−
16. *Agrilus* (s. str.) *salicivola* Y. Kurosawa, 1963 **stat. nov.**	−
17. *Agrilus* (s. str.) *suvorovi* Obenberger, 1935 **stat. nov.**	
18-1. *Agrilus* (s. str.) *viduus chinganicus* Obenberger, 1922	−
18-2. *Agrilus* (s. str.) *viduus subviduus* Y. Kurosawa, 1957	+
19. *Agrilus* (s. str.) *viridis* (Linnaeus, 1758)	
Subgenus *Anambus* C. G. Thomson, 1864	
20. *Agrilus* (*Anambus*) *cyaneoniger* E. Saunders, 1873	
Subgenus *Dentagrilus* Alexeev, 1998	
21. *Agrilus* (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956	+
22. *Agrilus* (*Dentagrilus*) *cyanescens* (Ratzeburg, 1873)	+
23. *Agrilus* (*Dentagrilus*) *pooli* Théry, 1936	−
Subgenus *Orientagrilus* Alexeev, 1998	
24. *Agrilus* (*Orientagrilus*) *tempestivus* Lewis, 1893	
Subgenus *Pseudoquercagrilus* Alexeev, 1998	
25. *Agrilus* (*Pseudoquercagrilus*) *asiaticus* Kerremans, 1898	
Subgenus *Quercuagrilus* Alexeev, 1998	
26. *Agrilus* (*Quercuagrilus*) *adelphinus* Kerremans, 1895	
27. *Agrilus* (*Quercuagrilus*) *fissus* Obenberger, 1917	+
28. *Agrilus* (*Quercuagrilus*) *friebi* Obenberger, 1922	
29. *Agrilus* (*Quercuagrilus*) *marginicollis* E. Saunders, 1873 **stat. nov.**	+
30. *Agrilus* (*Quercuagrilus*) *ribbei* Kiesenwetter, 1879	
31. *Agrilus* (*Quercuagrilus*) *ussuricola* Obenberger, 1924	
32. *Agrilus* (*Quercuagrilus*) *varius* Kerremans, 1895 **stat. nov.**	+

Table 5. (Continued)

Subgenus *Robertius* Théry, 1947

33. *Agrilus* (*Robertius*) *delphinensis* Abeille de Perrin, 1879 −
34. *Agrilus* (*Robertius*) *komareki* Obenberger, 1925
35. *Agrilus* (*Robertius*) *moerens* E. Saunders, 1873
36. *Agrilus* (*Robertius*) *nicolanus* Obenberger, 1924 −
37. *Agrilus* (*Robertius*) *pekinensis* Obenberger, 1924 −
38. *Agrilus* (*Robertius*) *peregrinus* Kiesenwetter, 1879
39. *Agrilus* (*Robertius*) *pseudocyaneus* Kiesenwetter, 1857
40. *Agrilus* (*Robertius*) *sibiricus* Obenberger, 1912 −
41. *Agrilus* (*Robertius*) *smaragdinus* Solsky, 1876 **stat. nov.**
42. *Agrilus* (*Robertius*) *soudeki* Obenberger, 1925
43. *Agrilus* (*Robertius*) *subauratus amurensis* Obenberger, 1922

Subgenus *Sinagrilus* Alexeev, 1998

44. *Agrilus* (*Sinagrilus*) *coreanus* Obenberger, 1935 −

Subgenus *Sinuatiagrilus* Alexeev, 1998

45. *Agrilus* (*Sinuatiagrilus*) *mali* Muramatsu, 1924

Subgenus *Uragrilus* Semenov, 1935

46. *Agrilus* (*Uragrilus*) *ater* (Linnaeus, 1767) −
47. *Agrilus* (*Uragrilus*) *fleischeri* Obenberger, 1925 **stat. nov.**
48. *Agrilus* (*Uragrilus*) *planipennis* Fairmaire, 1888
49. *Agrilus* (*Uragrilus*) *rokuyai* Y. Kurosawa, 1976 +
50. *Agrilus* (*Uragrilus*) *tokyoensis* Y. Kurosawa, 1985 **stat. nov.** +

Subgenus *Xeragrilus* Alexeev, 1998

51. *Agrilus* (*Xeragrilus*) *ecarinatus* Marseul, 1866

+: newly rocorded species in Korea, −: unexamined Korean species

2. 한국산 호리비단벌레속의 분류

Superfamily Buprestoidea Leach, 1815 비단벌레상과

Family Buprestidae Leach, 1815 비단벌레과

Subfamily Agrilinae Laporte, 1835 호리비단벌레아과(신칭)

Tribe Agrilini Laporte, 1835 호리비단벌레족(신칭)

Subtribe Agrilina Laporte, 1835 호리비단벌레아족(신칭)

Genus *Agrilus* Curtis, 1825 호리비단벌레속(신칭)

Agrilus Curtis, 1825: 67.

Type species: *Buprestis viridis* Linnaeus, 1758.

See Bellamy (2003) for more synonymy and references.

Key to the subgenera and the incertae sedis species of the genus *Agrilus*

1. Abdominal tergite VII with distinct median longitudinal carina, extending beyond posterior margin in the form of a blunt spine ····· **2**
− Abdominal tergite VII with median longitudinal carina (sometimes poorly developed or entirely vanished), not extending beyond posterior margin ····· **4**
2. Pronotal submarginal carinae merged with marginal carinae at posterior end ····· ***A. yamawakii***
− Pronotal submarginal carinae not merged with marginal carinae ····· **3**
3. Vertex with longitudinal punctate striae; Pronotum about 1.1-1.3 times

as wide as long; Male abdominal sternite II with paired tubercles in the middle; Penis apex truncate ····· ***A.* (*Pseudoquercagrilus*)**

– Vertex with concentric pattern of punctate striae occasionally indistinct laterally at base; Pronotum about 1.4-1.6 times as wide as long; Male abdominal sternite II without paired tubercles; Penis apex narrow or wide ····· ***A.* (*Uragrilus*)**

4. Pronotal submarginal carniae not merged with marginal carinae before posterior margin of pronotum ····· **5**

– Pronotal submarginal carinae merged with marginal carinae before posterior margin of pronotum ····· **10**

5. Pronotal prehumeral carinae obsolete or obliterate ····· **6**

– Pronotal prehumeral carinae apparent ····· **7**

6. Frons with distinct transverse impression; Scutellum with obsolete or obliterate transverse carina, often deeply impressed on disk ····· ***A.* (*Anambus*)**

– Frons without transverse impression; Scutellum with well-developed transverse carina, not impressed on disk ····· ***A. decoloratus alazon***

7. Pronotum with entire longitudinal median groove without transverse elevation ····· ***A.* (*Quercuagrilus*)**

– Pronotal median groove separated by transverse elevation ····· **8**

8. Pronotal prehumeral carinae not merged marginal carinae before posterior margin of pronotum ····· **9**

– Pronotal prehumeral carinae merged marginal carinae before posterior margin of pronotum ····· **10**

9. Elytra with tomentose spots in adsutural apical third

····· ***A.* (*Sinuatiagrilus*)**

– Elytra without tomentose spots ····· ***A. daimio***

10. Apex of penis widely rounded laterally, with wide semi-circular incision in the middle ····· ***A.* (*Orientagrilus*)**

– Apex of penis without median incision ····· **11**

11. Elytra with a large triangular or somewhat diamond-shaped spot on the disc, and apex brilliantly copper-coloured, the rest covered with silvery-gray hairs ····· ***A. discalis***

– Elytra posterior third to apex blackish brown with only a white tomentose spots ····· ***A. euonymi***

12. Pronotal submarginal carinae merged with marginal carinae at posterior margin of pronotum ····· **13**

– Pronotal submarginal carinae not merged with marginal carinae ····· **15**

13. Pronotal prehumeral carinae obsolete or obliterate ····· ***A.* (*Xeragrilus*)**

– Pronotal prehumeral carinae apparent ····· **14**

14. Sized small about 4.3-5.4; Elytra entirely glabrous without distinct pubescence ····· ***A. subrobustus***

– Sized middle to large about 7.1-10.7 mm; Elytra entirely covered with faint yellowish pubecence ····· ***A. imitans***

15. Elytra apices separately rounded without distinct spine ····· **16**

– Elytra apices with distinct projecting spine ····· **22**

16. Vertex with straight or partly arcuate, puntate striae forming no distinct concentric pattern ····· **17**

– Vertex with punctate striae forming concentric pattern ····· **19**

17. Frons slightly convex; Elytra entirely glabrous without distinct pubescence ····· ***A.* (s. str.)**

– Frons almost flattened; Elytra with three pairs of tomentose spot ·· **18**

18. Sized large about 10.7 mm; entirely lustrous; vertex slightly grooved medially; pronotum widest at posterior third ····· ***A. ventricosus***

– Sized middle about 5.5-7.8 mm; entirely mat; vertex without median groove; pronotum widest just behind the anterior margin ···· ***A. sospes***

19. Body entirely covered with white, or yellowish, shining pubescence ····· ***A.* (*Xeragrilus*)**

– Body entirely glabrous without distinct pubescence ····· **20**

20. Vertex slightly convex without median groove ····· ***A.* (*Robertius*)**

– Vertex with wide and deep median groove ····· **21**

21. Sized small to middle about 3.5-7.6 mm; lateral edge of penis in anterior half or nearly to base with large thick dents pointed to penis base ····· ***A.* (*Dentagrilus*)**

– Sized middle to large about 6.8-13.6 mm; lateral edge of penis without dents and not pointed to penis base ····· ***A.* (*Sinagrilus*)**

22. Vertex with longitudinal lines composed of small punctures; laterosternites without tomentose spots ····· ***A. spinipennis***

– Vertex slightly grooved medially, with fine concentric lines of small punctures; laterosternites with large tomentose spots ····· **23**

23. Elytra in adsutural apical third with oval, mazarine spot ····· ***A. chujoi***

– Elytra without oval mazarine spot in adsutural apical third ····· ***A. plasoni***

species incertae sedis, genus *Agrilus*

아속불명

1. *Agrilus chujoi* Kurosawa

황녹색호리비단벌레

[Pls. I-a, V-a]

Agrilus chujoi Kurosawa, 1985: 141-151, figs. 6a-b (Japan). HT ♂ in NSMT.

Korean records. ***Agrilus chujoi***: Kurosawa, 1985: 141-151; Tôyama, 1985b: 25; Tôyama, 1989: 322; Kim and Park, 1991a: 154; Kim and Park, 1991b: 193; Kim et al., 1991a: 170; Kim et al., 1991b: 180; Park et al., 1993: 179; Kim et al., 1994b: 156; Kim, 1995a: 166; Kwon et al., 1996: 284; Akiyama and Ohmomo, 1997: 31; Kim and Kim, 1997: 128; An, 1998: 37; Lee et al., 1998: 41; Akiyama and Ohmomo, 2000: 271; An, 2001: 45; Jendek, 2001c: 2-3; Hua, 2002: 89; Jendek, 2006c: 397.

Korean name. 황녹색호리비단벌레(Park et al. 1993).

Description. Body length about 6.0-8.0 mm; subcylindrical, robust about 3.3-3.5 times as long as wide. Dorsal side lustrous; head and pronotum usually dull green or greenish brown, sometimes dull brown; elytra dull green or greenish brown with oval mazarine spot in adsutural apical third; abdominal tergites deep blue; abdominal laterotergites bluish black; abdominal laterotergite I with distinct white tomentose spots. Head distinctly narrower than the base of pronotum; frons neither depressed

nor convex, transversely rugoso-punctate with inconspicuous median impression; vertex concentrical rugoso-punctate with shallow median groove; eyes not so large; antennae serrate from the fourth segment. Pronotum transverse, about 1.5 times as wide as long, widest at just behind the middle; sides evenly arcuated; prehumeral carinae somewhat obsolete, extending to posterior third of pronotum and not merged with the marginal ones; submarginal carinae sinuate and approximate to the marginal carinae posteriorly, but not merged with it and become obsolete in posterior fourth; disc convex, median depression separated by transverse elevation; anteromedian depression nearly obsolete and posteromedian one rather deep and elongate. Scutellar transverse carina well developed. Elytra about 3.3-3.4 times as long as wide, widest at humeri or at the middle; apices with outer marginal spine rather obtuse and feebly protruding. Abdominal tergites III and IV slightly grooved medially; tergite V almost flattened medially; tergites VI and VII flattened medially with distinct longitudinal median carinae; carina of tergite VII not extended beyond posterior margin; abdominal laterosternites I-III narrowly exposed from elytra. Ventral side slightly lustrous, entirely bluish black; abdominal sternites II-V with a pair of white tomentose spots on latero anterior parts of each segment. Prosternal process subparallel between coxae, then regularly tapering to tip. Abdominal sternite V rounded apically. **[Male]** Frons blue green; frontal lateral margins more narrowed anteriad. Prosternal process with dense and long pubescence. **[Female]** Frons reddish brown; frontal lateral margins less narrowed anteriad. Prosternal process with sparse and short

pubescence.

Distribution. Korea, China (Guandong & Liaoning) and Japan (Tsushima).

Host plant. *Pueraria thunbergiana* 칡 (Kurosawa 1985; Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♀, Mt. Soyosan, 14 VII 1934, S Eguchi; 1♂ 1♀, ibid., 13 VII 1941, Cho PS; 1♂1♀, Songcheon-ri Sudong-myeon Namyangju-si, 5 VII 1942, Cho PS; 1♂, ibid., 12 VII 1942, Cho PS; 1 ♂, Sangcheon-ri Cheongpyeong-myeon Gapyeong-gun, 9 VII 1944, Cho PS; 1♂, Mt. Chungnyeongsan Sudong-myeon Namyangju-si, 6 VIII 1980, Park HG; 1♂1♀, ibid., 6 IX 1980, Jang GS; 1ex., Jinburyeong, 12 VIII 1980, Yoon SJ; 1♂1♀, Gwanggyo Suwon-si, 9 IX 1981, Jung G; 1♀, Mt. Yongmunsan Yeonsu-ri Yongmun-myeon Yangpyeong-gun, 3 X 1981, Jang GS; 1♂, Is. Uldo Deokjeok-myeon Ongjin-gun Incheon-si, 3 VIII 1982, Jang GS; 1♀, Is. Seongapdo Ongjin-gun Incheon-si, 4 VIII 1982, Jang GS; 1♂, Mt. Cheonggyesan, 26 VI 1984, Lee MH; 1♀, ibid., 24 IX 1994, Kim JY; 1♀, Mt. Mugapsan Gwangju-si, 5 VII 1991, Kim GM; 1♂1♀, Mt. Myeongjisan Buk-myeon Gapyeong-gun, 19 VII 1991, Kim JI; 1♂, ibid., 28 V 1992, Kim YJ; 1♀, ibid., 28 V 1992, Choi JY; 1♂, Gangssibong Ildong-myeon Pocheon-gun, 18 VII 1997, Kim JI and Kin SY; 1♂, Mt. Hwaaksan Buk-myeon Gapyeong-gun, 25 VII 1998, Lee HA; 1♀, Mt. Yongmunsan Yongcheon-ri Okcheon-myeon Yangpyeong-gun, 25 VIII 1998, Kim SY; 1♂1♀, Uiwang-si, 19 VII 2004, An SL; 2♀, Mt. Moraksan, 20 VII 2004, An SL; 1♂, Mt. Chungnyeongsan, 10 VIII 1996, Sohn JC. **[GW]** 1♂, Myeongho-ri Hyeonnae-myeon Goseong-gun, 10 VII 1990, Park HC; 1♀, ibid., 10

VII 1990, Kim JI; 1♂, Gojindong *valley* Mt. Geonbongsan Goseong-gun, 28 VIII 1990, Kim JI; 1♂, ibid., 28 VIII 1990, Lee OJ; 1♀, Geonbongsa Naengcheon-ri Naejin-eup Goseong-gun, 28 VIII 1990, Lee OJ; 5♂3♀, Balsan2-ri Sinbuk-eup Chuncheon-si, 29 VI 1998, Park HC; 1♂1♀, ibid., Jang SS; 2♀, ibid., 25 VII 1998, Park HC; 2♂, Osaegyaksu Seo-myeon Yangyang-gun, 20 VII 2000, Kim HG; 2♀, Sagimak-ri Sacheon-myeon Gangneung-si, 17 VII 2003, Yoo IS; 2♂5♀, Sammachi-ri Hongcheon-eup Hongchoen-gun, 25 VI 2005, Lee JG; 2♂, Jucheon-ri Jucheon-myeon Yeongwol-gun, 4 VIII 2005, Jung BH. **[CB]** 1♂2♀, Cheongdong *valley* Mt. Sobaeksan Cheongdong-ri Danyang-eup Dangyang-gun, 2 VIII 1994, Kim JI; 1♂, ibid., 3 VIII 1994, Moon TY; 1♂, Mt. Woraksan Jecheon-si, 28 VIII 1994, Lee JM; 1♂1♀, ibid., 4 VI 1997, Jin YH; 1♂, ibid., 25 VII 2004, Yoo IS; 1♀, ibid., 25 VII 2004, Lee JG; 1♂, Guksabong Guksa-ri Oksan-myeon Cheongwon-gun, 23 VII 1997, Kim JI; 1♂, Mt. Taehwasan Osa-ri Yeongchun-myeon Danyang-gun, 27 VIII 2001, Kim SY and Kim AY. **[CN]** 1♂, Mt. Gyeryongsan, 11 VII 1995, Anonym; 1♀, Naengcheon *valley* Mt. Chilgapsan Cheongnyanggun, 13 VII 2000, Park SJ; 4♂, Sangsin-ri Banpo-myeon Gongju-si, 6 IX 2000, Kim WM; 1♂7♀, Baengnipo *beach* Sowon-myeon Taean-gun, 27 VIII 2005, Lee JG. **[JB]** 1♂, Mt. Naejangsan, 3 VIII 1974, Nam SH; 1♂, Baemsagol Mt. Jirisan Waun-ri Sannae-myeon Namwon-gun, 3 VIII 1984, Jang GS; 7♂, ibid., 31 VII 1992, Park JS; 1♂, Gunmakdong Byeonsan-myeon Buan-gun, 17 VII 1998, Lee CH; 1♀, Naesosa Byeonsan-myeon Buan-gun, 17 VII 1998, Chang YJ; 2♂, Maljae Byeonsan-myeon Buan-gun, 17 VII 1998, Chang

YJ; 2♂, ibid., 17 VII 1998, Lee CH; 2♂1♀, ibid., 17 VI 1998, Ryu SM; 1♀, Geoseok Byeonsan-myeon Buan-gun, 5 IX 1998, Chang YJ; 5♂2♀, Mt. Daedunsan Wanju-gun, 9 VIII 2000, Park HC; 1♂3♀, Mt. Seonunsan Asan-myeon Gochang-gun, 29 VII 2004, Lee JG. **[JN]** 1♂, Dogapsa Dogap-ri Gunseo-myeon Yeongam-gun, 26 VII 1988, Lee SH; 1♂, Mt. Baegunsan Gwangyang-si, 10 VIII 1993, Kim SY; 1♀, Dapgok-ri Okryong-myeon Gwangyang-si, 10 VIII 1993, Hah SY; 1♂, Piagol ~ Nogodan Mt. Jirisan, 2 VIII 1996, Lee HG; 1♂, Simwon Mt. Jirisan Sandong-myeon Gurye-gun, 4 VIII 1996, Song JH; 1♀, Mt. Suryeonsan, 30 VIII 1997, An SL; 2♂1♀, Mt. Jirisan Gurye-gun, 1 VIII 1998, Han TM; 1♀, Mt. Gayasan Gwangyang-si, 11 VII 1999, Lee SY; 1♀, Jeungsangsa Mt. Mudeungsan Gwangju-si, 4 VIII 2000 Kim TW. **[GB]** 1ex., Seonginbong Is. Ulleungdo Ulleung-eup Ulleung-gun, 28 VII 1976, Yoon SJ; 2♂2♀, Mungyeongsaejae Mungyeong-eup Mungyeong-si, 10 VII 1977, Yeo IS; 1♀, ibid., 10 VII 1977, Lee JW; 1♂, ibid., 22 VI 1989, Lee OJ; 1♂, Mt. Bibongsan, 21 VII 1999, An SL; 1♀, Mt. Biseulsan Dalseong-gun, 10 ~ 11 VII 2000, Kim JI; 1♂, Goran Sinseong-ri Andeok-myeon Cheongsong-gun, 16 VII 2000, Baek SH; 1♀, Huibang *valley* Mt. Sobaeksan Yongju-si, 24 VII 2004, Lee JG; 3♂1♀, ibid., 24 VII 2004, Yoo IS. **[GN]** 1♂, Mt. Jirisan Jungsan-ri Sicheon-myeon Sancheong-gun, 30 VII 1981, Kim JI; 1♂, Mt. Hwangseoksan Hamyang-gun, 25 VII 1985, Park JS; 1♂, ibid., 26 VII 1985, Park JS; 1♂, Icheon-ri Sangbuk-myeon Ulju-gun, 28 VI 1989, Lee DI; 1♂, Chilseon *valley* Chuseong-ri Macheon-myeon Hamyang-gun, 25 ~ 26 VII 1990, Eun JE; 2♂, Chuseongdong Macheon-myeon

Hamyang-gun, 29 ~ 30 VII 1992, Anonym; 1♂, Sinhyeon-eup Geoje-si, 9 VII 1996, Anonym; 1♂, Cheongnyangsa Hwangsan-ri Gaya-myeon Hapcheon-gun, 20 VII 1997, Chun JS; 1♂, Mt. Sanbangsan Sanbang-ri Dundeok-myeon Geoje-si, 17 IX 1997, Anonym; 1♂, Songamsa Mt. Songaksan Ojeon-ri Obu-myeon Sancheong-gun, 22 VIII 1998, Kim SY; 1♂, Hyangnobong Mt. Waryongsan Goseong-gun, 5 VIII 1999, Chun JS; 1♀, ibid., 5 VIII 1999, Lee SY; 1♀, Danjibong Mt. Gayasan Chiil-ri Gaya-myeon Hapcheon-gun, 19 VIII 1999, Kim SY. **[JJ]** 1♀, Jungang-dong Seogwipo-si, 26 VII 1998, Park.

2. *Agrilus daimio* Obenberger

검은띠호리비단벌레

[Pl. I-b]

Agrilus daimio Obenberger, 1936: 140-141 (Japan). LT ♀ in NMP.

Description. [Female] Body length about 4.5-5.5 mm; subcylindrical, robust about 3.3 times as long as wide. Dorsal side feebly lustrous; head and pronotum dark grayish green; pronotum with faint white pubescent vittae in medially; elytra greenish brown, entirely covered with white pubescence except of apical third; abodominal tergites dark purplish blue; abdominal laterotergites dark grayish green with recumbent pubescence. Ventral side lustrous, greenish brown. Head slightly narrower than the base of pronotum; frons slightly convex; vertex longitudinal punctate striae with shallow median groove; eyes small; antennae serrate from the

fourth segment. Pronotum transverse, about 1.6 times as wide as long, widest at the middle; sides regularly arcuated. Scutellar transverse carina well developed. Elytra about 2.9 times as long as wide at humeri; apices rounded apically. Abdominal tergite VII with longitudinal median carina; abdominal sternite V rounded apically.

Distribution. Korea **(new record)** and Japan (Honshu, Kyushu, Tsushima & Yakushima).

Host plant. *Parabenzoin praecox* (Akiyama & Ohmomo 1997).

Specimens examined. **[GG]** 1♀, Mt. Cheonmasan Namyangju-si, 23 VI 1997, Sohn JY. **[GW]** 1♀, Sangwonsa Mt. Odaesan Jinbu-myeon Pyeongchang-gun, 22 VIII ~ 20 X 2000, Ahn KJ, *ex*. FIT; 1♀, Gaeryeong *falls* Mt. Baegamsan Naechon-myeon Hongcheon-gun, 25 V ~ 20 VI 2002, Park SJ and Park JS, *ex*. FIT. **[CB]** 1♀, Miwon-ri Miwon-myeon Cheongwon-gun, 24 VI ~ 1 VII 2005, Anonym, *ex*. Malaise trap. **[CN]** 1♀, Mt. Gyeryongsan, 9 VIII 1992, An SL; 1♀, Gapsa Mt. Gyeryongsan Gyeryong-myeon Gongju-si, 3 ~ 14 VI 2000, Park SJ and Kim MS, *ex*. FIT; 3♀, Mt. Gyeryongsan Sangsin-ri Banpo-myeon Gongju-si, 31 V ~ 18 VI 2004, Choi SM and Park JS, *ex*. FIT; 1♀, Nammaetap Mt. Gyeryongsan Banpo-myeon Gongju-si, 1 ~ 18 VI 2004, Choi SM and Park JS, *ex*. FIT. **[JB]** 3♀, Yongsan-dong Jeongeup-si, 19 V ~ 19 VI 2004, Yun MK, *ex*. Malaise trap. **[GN]** 1♀, Gajwa-dong Jinju-si, 6 ~ 12 V 1989, Anonym.

Remarks. Only female specimens were examined in this study. So, further studies and male specimens are needed. This species is newly recorded from Korea.

3. *Agrilus decoloratus alazon* Lewis

울릉호리비단벌레(개칭)

[Pls. I-c, V-b]

Agrilus alazon Lewis, 1893: 333 (Japan). LT ♂ in NHM.

Agrilus decoloratus alazon: Jendek, 1995a: 143.

Korean records. ***Agrilus alazon***: Kim et al., 1971: 53; Lee and Kwon, 1982: 154; Kim et al., 1994b: 156; Kwon et al., 1996.

Korean name. 울릉비단벌레(Lee & Kwon 1982).

Description. Body length about 10.3-11.2 mm; subcylindrical, remarkably elongate about 3.6-4.1 times as long as wide. Dorsal side lustrous, coloration variable; head and pronotum dull green; elytra blackish red purple with four pairs of tomentose spots; abdominal laterosternite I with white tomentose spots. Ventral side greenish olivaceous with a lustrous. Head slightly narrower than the base of pronotum; frons almost flat, transversely rugoso-punctate; vertex slightly grooved medially with longitudinal lines composed of small punctures; eyes large; antennae serrate from the fourth segment. Pronotum transverse, about 1.5 times as wide as long, widest at posterior third; Prehumeral carinae short and obtuse; medial pronotal groove divided into a shallow anterior depression and a posterior depression. Scutellar transverse carina well developed. Elytra about 1.7 times as long as wide at humeri; apices slightly serrated with a feebly medial spine. Abdominal tergite VII with obsolete

longitudinal median carna; abdominal sternite V rounded apically.

Distribution. Korea (South), Japan (Honshu, Shikoku, Kyushu & Tsushima) and Taiwan.

Host plant. *Celtis sinensis* var. *japonica* (Akiyama & Ohmomo 1997).

Specimens examined. **[GG]** 1♀, Gongse2-ri Gaegun-myeon Yangpyeong-gun, 6 VI 2001, Kim WM. **[JB]** 1♂, Mt. Seonunsan Gochang-gun, 25 VI 1981, Kim SM. **[JN]** 4♂4♀, Is. Wando Wando-eup Wando-gun, em. ? II 2002, Oh HY, *ex*. breeding. **[GB]** 1♀, Is. Ulleungdo Ulleung-gun, 12 VIII 1971, Kim JI. **[JJ]** 1♀, Dokkaebidoro Nohyeong-dong Jeju-si, 10 VII 2002, Kim TW.

Remarks. This species differs from nominotypical species in having elytral apices only feebly acuminate or regularly separately rounded.

4. *Agrilus discalis* E. Saunders

모무늬호리비단벌레(개칭)

[Pls. I-d, V-c]

Agrilus discalis E. Saunders, 1873: 514-515 (Japan).

Korean records. ***Agrilus discalis***: Ishii, 1940: 46; Lee and Kwon, 1982: 154; Kim et al., 1994b: 156; Kwon et al., 1996.

Korean name. 모무늬비단벌레(Lee & Kwon 1982).

Description. Body length about 6.2-7.8 mm; robust, subcylindrical. Dorsal side mat; head and pronotum coppery brown; elytra greenish gray with a large triangular or somewhat diamond-shaped spot on the disc, and apex

brilliantly copper-coloured, the rest covered with silvery-gray hairs. Ventral side lustrous, coppery brown. Frons slightly convex; vertex slightly grooved mdeially with longitudinal lines composed of small punctures; eyes small. Pronotum transverse, about 1.3 times as wide as long, widest at posterior third; prehumeral carinae extends from the base to the anterior angles and widely sinuous in the middle; medial pronotal groove divied into a indistinct anterior depression and a posterior shallow depression. Scutellar transverse carina well developed. Elytra about 2.9 times as long as wide, widest in middle; apices slightly produced and strongly serrated. Abdominal tergite VII rounded with distinct longitudinal median carina; abdominal sternite incurved apically. **[Male]** Frons greenish gray with dense white pubescence. **[Female]** Frons coppery brown with sparse white pubescence.

Distribution. Korea (South), China (Guizhou, Hainan, Hubei, Hunan & Yunnan), Japan, India (Kashmir) and Taiwan.

Host plants. *Celtis sinensis* var. *japonica* and *Zelkova serrata* 느티나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GW] 1♂, Eulmun4-ri Sinbuk-eup Chuncheon-si, 10 V 2001, Kim WM. **[GB]** 1♂, Is. Ulleungdo Namyang-ri Seo-myeon Ulleung-gun, 23 V 1995, Kwon YD and Byun BK. **[GN]** 1♀, Mt. Jwaisan Songcheon-ri Hail-myeon Goseong-gun, 5 V 2000, Shim MA; 1♀, Dangchon-ri Daepyeong-myeon Jinju-si, 22 VI 2001, Shin JS. **[JN]** 1♀, Samdu-ri Unoe-myeon Wando-gun, 17 VI 1998, Park HC; 1♀, Dapgok-ri Ssangam-dong Jeongeup-si, 20 VI 2005, Kim KB. **[JJ]** 1ex., Seogwipo-si, 15 VII 1975, Kim HS; 1♂2♀, Is. Jejudo, 10 V 1997,

Sohn JC; 1♀, Yeongsil Hawon-dong Seogwipo-si, 26 V 2005, Jung BH.

Remarks. The adult common in winter under the loosened bark of the host plants.

5. *Agrilus euonymi* Tôyama

사철나무호리비단벌레(신칭)

[Pls. I-e, V-d]

Agrilus euonymi Tôyama, 1985a: 28-30. (Japan). HT in NSMT.

Korean record. ***Agrilus euonymi***: Jendek, 2006c: 398 (N. Korea).

Description. Body length about 4.6-5.2 mm; subcylindrical, robust about 3.3-3.5 times as long as wide. Dorsal side olivaceous green with a shining white pubescence; head and pronotum blackish brown; elytra posterior third to apex blackish brown with only a white tomentose spots. Ventral side olivaceous green with a lustrous. Frons slightly convex; vertex slightly grooved medially with longitudinal rugose; eyes moderate. Pronotum transverse, about 1.5 times as wide as long widest at middle; prehumeral carinae strongly curved at middle, reaching to anterior margin of pronotum; prescutellar depression slightly deep and elongate. Scutellar transverse carina well developed. Elytra about 2.8 times as long as wide at humeri, slightly acuminate in posterior third; apices acuminated to the elytral suture. Abdominal tergites III-VI slightly grooved medially without carinae; tergite VII with distinct longitudinal median carina, not extending beyond posterior margins; abdominal sternite

V slightly incurved apically. **[Male]** Frons yellow green, more lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Prosternal process with dense and long white pubescence. Abdominal sternites I and II somewhat flat, with longitudinal median groove. **[Female]** Frons blackish brown, less lustrous; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Prosternal process with sparse and short white pubescence. Abdominal sternites I and II rather convex, without longitudinal median groove.

Distribution. Korea, China (Shaanxi & Shanghai) and Japan (Honshu, Kyushu & Is. Oki).

Host plants. *Euonymus japonicus* 사철나무 and *Prunus yedoensis* 왕벚나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♀, Seoul-si, 1 VII 1941, Cho PS; 1♀, Mt. Baegunsan, 20 VII 1986, An SL; 1♀, Mt. Myeongjisan Gapyeong-gun, 1 VIII 1993, Kim SY; 1♂, Jeongneung Seongbuk-gu Seoul-si, 10 VII 2003, Kang W. **[CN]** 1♂, Hagampo *beach* Wonbuk-myeon Taean-gun, 24 VI ~ 22 VII 2006, Kim TW, Kang TH and Yoo IS, *ex*. Malaise trap. **[JB]** 1♂, Byeonsanbando Buan-gun, 2 VI 2001, An SL; 1♂, Hyeonnae-ri Mupung-myeon Muju-gun, 13 V 2005, Lee JG. **[JN]** 1♀, Mt. Obongsan Buheung-ri Cheongsan-myeon Wando-gun, 17 VI 1998, Park HC. **[GB]** 1♀, Sogwang-ri Seo-myeon Uljun-gun, 1 VII 1999, Kim JI.

Remarks. This species is firstly recorded from South Korea.

6. *Agrilus imitans* Lewis

나도붉은가슴호리비단벌레(신칭)

[Pls. I-f, V-e]

Agrilus imitans Lewis, 1893: 332-333 (Japan). Five syntypes in NHM.

Korean record. ***Agrilus imitans***: Park et al., 1993: 179.

Description. Body length about 7.1-10.7 mm; Body elongate about 3.8-4.2 times as long as wide. Dorsal side lustrous; head and elytra blackish blue; pronotum carmine, glabrous; elytra with short and dense yellowish pubescence. Ventral side lustrous, entirely carmine. Frons flat with a shallow medial groove; vertex slightly grooved medially with longitudinal lines composed of small punctures; eyes large. Pronotum transverse, about 1.4 times as wide as long, widest at middle; sides evenly arcuate, posterior angles obtuse; disc transversely rugoso; prehumeral carinae extends from the base to the anterior angle. Scutellar transverse carina well developed. Elytra about 3.2 times as long as wide, widest at posteroir third; apices rounded, feebly and indistinctly serrate, slightly outwardly bent. Abdominal tergites III-V slightly or indistinctly grooved medially without cairnae; abdominal tergites VI and VII with distinct longitudinal median carinae; carina of tergite VII not extended beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons yellow green, more lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Prosternal process with dense and long white pubescence. Hind femoral pubescence more dense and long.

Abdominal sternites I and II somewhat flat, with indistinct longitudinal median groove. **[Female]** Frons blackish brown, less lustrous; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Prosternal process with sparse and short white pubescence. Hind femoral pubescence sparse and short. Abdominal sternites I and II feebly convex, without longitudinal median groove.

Distribution. Korea (South) and Japan (Hokkaido, Honshu, Shikoku, Kyushu & Tsushima).

Host plants. *Celtis sinensis* var. *japonica*, *Ulmus davidiana* var. *japonica* 느릅나무 and *Zelkova serrata* 느티나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♀, Mt. Goryeongsan Gwangtan-myeon Paju-si, 21 VI 1997, Lim JY. **[JN]** 2♀, Is. Wando Wando-eup Wando-gun, ? II 2002 (breeding), Oh HY; 1♀, ibid., ? IV 2002 (breeding), Oh HY. **[GN]** 2♂, Is. Geojedo Geoje-si, 2 VIII 2001, Oh HY.

7. *Agrilus plasoni* Obenberger
멋쟁이호리비단벌레(신칭)
[Pls. I-g, V-f]

Agrilus plasoni Obenberger, 1917: 212-213 (China). HT ♂ in NMP.
See Jendek (2006c) for more synonyms and references.

Description. Body length about 5.7-8.9 mm; subcylindrical, elongate about 3.5-3.8 times as long as wide. Dorsal side lustrous; head green or carmine; pronotum carmine; elytra green with white tomentose spots at

posterior third; abdominal laterosternites with large white tomentose spots. Ventral side blackish blue. Frons slightly convex; vertex slightly grooved medially with longitudinal rugose; eyes medium. Pronotum transverse, about 1.5 times as wide as long, widest at middle; sides regularly curved. Scutellar transverse carina well developed. Elytra about 3.1 times as long as wide at humeri; apices with outer marginal spine. Abdominal tergites III-V slightly or indistinctly grooved medially; abdominal tergite VI with feeble longitudinal median carina; abdominal tergite VII with distinct longitudinal median carina, but not extending beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons blue green, lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. **[Female]** Frons reddish brown, lustrous; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad.

Distribution. Korea **(new record)**, China (Fujian, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Shaanxi, Xizang, Yunnan & Zhejiang), Laos and Vietnam.

Host plant. Unknown.

Specimens examined. **[GG]** 1♀, Suwon-si, 7 X 2001, Choi JA. **[GW]** 1♂, Mt. Seoraksan, 7 VIII 1958, Anonym; 1♀, Samhwasa Samhwa-dong Donghae-si, 26 VI 1984, Choe HS; 1♂, ibid., 27 VI 1984, Myeong MW; 1♂, ibid., 27 VI 1984, Lee MI; 1♀, ibid., 27 VI 1984, Bang SH; 1♂, Samcheok-si, 27 VI 1984, Kim SM; 1♂, Geonbongsa Naengcheon-ri Geojin-eup Goseong-gun, 2 VIII 1992, Park HC; 2♂, Seongguksa Osaek-ri, Seo-myeon Yangyang-gun, 19 VII 2000, Kim HG; 1♀, Sanghwangjimi Mt. Seokbyeongsan Sangye-ri Okgye-myeon

Gangneung-si, 15 VIII 2002, Yeo JD; 1♂, Eohol-ri Seongsan-myeon Gangneung-si, 29 VI 2003, Yoo IS; 1♀, Mt. Geombongsan Nogok3-ri Wondeok-myeon Samcheok-si, 18 VI 2005, Kim TW; 1♀, Mt. Dutasan, 12 VIII 2005, Kang TH. **[CB]** 1♀, Songmyeon-ri Cheongjeong-myeon Goesan-gun, 23 VI 1989, Cho HS. **[JB]** 1♀, Is. Seonyudo Seonyudo-ri Okdo-myeon Gunsan-si, 20 VIII 1996, Shim SY. **[JN]** 1♂1♀, Is. Geomundo Samsan-myeon Yeosu-si, 13 VII 1984, Kim JI; 1♀, Dapgok-ri Okryong-myeon Gwangyang-si, 24 VI 1994, Kim JH; 1♀, Chusan-ri Okryong-myeon Gwangyang-si, 27 VI 1994, Lee HS; 1♂, Mt. Chirisan, 4 VI 1998, Park CW. **[GB]** 1♀, Is. Ulleungdo, Ulleung-gun, 27 VII ~ 8 VIII 1978, Park JS; 1♀, ibid., 2 VIII 1981, Park JS; 1♀, Buryeong *valley* Uljun-gun 26 VI 1990, Kang HO; 1♀, Mujechi *swamp* Mt. Jeongjoksan Ulju-gun Ulsan-si, 18 VI 1998, Jeong HG; 1♂, ibid., 20 VI 1998, Lim TH; 1♂, Unmunsa Mt. Unmunsan Sinwon-ri Unmun-myeon Cheongdo-gun, 18 VI 2001, Park HC; 1♀, Wangpi-ri Seo-myeon Uljin-gun, 21 VIII 2002, Lee JW. **[GN]** 2♀, Mt. Jirisan Jungsan-ri Sicheon-myeon Sancheong-gun, 30 VII 1981, Kim JI; 1♂, Okryeobong Is. Geojedo Geoje-si, 16 VIII 1986, An SL; 1♀, Mt. Baegunsan Baegun-ri Baekjeon-myeon Hamyang-gun, 12 ~ 13 VII 1990, Jeon JS; 1♂, Baekmudong Macheon-myeon Hamyang-gun, 24 ~ 25 VII 1990, Eun JI; 1♀, ibid., 24 ~ 25 VII 1990, Choe JS; 1♂1♀, Byeoksoryeong Mt. Jirisan, 29 VII 1992, Anonym; 2♀, Chuseongdong Macheon-myeon Hamyang-gun, 29 ~ 30 VII 1992, Anonym; 1♂, Jeolgol Gucheon-ri Dongbu-myeon Geoje-gun, 25 VI 1994, An TH; 1♀, Mt. Baegunsan Baekjeon-myeon Hamyang-gun, 16 VIII 1997, Anonym.

Remarks. This species is newly recorded from Korea.

8. *Agrilus quadrisignatus* Marseul
네무늬호리비단벌레

Agrilus quadrisignatus Marseul, 1866: 434, 444-445 (Russia). LT ♀ in NMP.

Korean records. ***Agrilus quadrisignatus***: Alexeev, 1989: 487 (N. Korea); Kim et al., 1994b: 157; Jendek, 2005: 17 (N. Korea); Jendek, 2006c: 401.

Korean name. 네무늬호리비단벌레(Kim et al. 1994b).

Distribution. Korea, Russia (East Siberia, Far East), Mongolia and China (Gansu, Hebei, Jiangsu, Nei Mongol & Shanxi).

Remarks. This species was reported for the first time in North Korea by Alexeev (1998) without particular records. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed.

9. *Agrilus sospes* Lewis
흰점호리비단벌레(개칭)
[Pls. I-h, V-g]

Agrilus sospes Lewis, 1893: 334 (Japan). Four syntypes in NHM.

Agrilus quadristictulus Obenberger, 1940: 179 (S. Korea). [syn. by Jendek

2005: 18-19]

Korean records. ***Agrilus quadristictulus***: Obenberger, 1940: 179 (S. Korea); ***A. sospes***: Kurosawa, 1963b: 152; Ju, 1969: 114 (N. Korea); Tôyama, 1985b: 26; Kim et al., 1994b: 157; Akiyama & Ohmomo, 1997: 39; Akiyama and Ohmomo, 2000: 276; An, 2001: 45; Jendek, 2005: 18-19; Jendek, 2006c: 401.

Korean names. 흰점긴구슬벌레(Ju 1969), 흰점비단벌레(Kim et al. 1994b).

Description. Body length about 5.5-7.8 mm; Body robust to elongate about 3.4-3.7 times as long as wide. Dorsal side mat, concolorous, entirely blackish brown; elytra with distinct three pairs of white tomentose spots. Ventral side lustrous, light blackish brown. Frons slightly convex; vertex indistinctly grooved medially with longitudinal lines composed of fine punctures; eyes medium. Pronotum transverse, about 1.4 times as wide as long, widest just behind the anterior margin, attenuate posteriorly; medial pronotal groove well developed, deep and longitudinal; prehumeral carinae very obsolete. Scutellar transverse carina well developed. Elytra about 3.2 times as long as wide at humeri, widest at posterior third; apices rounded apically with short, dense pubescence. Abdominal tergites III-VI slightly grooved medially without cairnae; tergite VII with feeble longitudinal median carina, not extending beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons yellow green, more lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Abdominal sternites I and II with distinct longitudinal median groove. **[Female]** Frons reddish brown, lustrous; frontal lateral

margins weakly S-shaped between eyes, less narrowed anteriad. Abdominal sternites I and II without longitudinal median groove.

Distribution. Korea, China (Liaoning, Shaanxi & Shanxi) and Japan (Hokkaido, Honshu, Shikoku, Kyushu& Tsushima).

Host plants. *Quercus dentata* 떡갈나무 and *Zelkova serrata* 느티나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♀, Gwaneum-ri Toechon-myeon Gwangju-si, 23 V 1993, Kim EH; 1♀, Paltan-myeon Hwaseong-gun, 25 V 1996, Lee JA; 1♀, Mt. Chungnyeongsan Sudong-myeon Namyangju-si, 4 VI 1999, Kim JI et al.; 1♀, Seodun-dong Gwonseon-gu Suwon-si, 9 V 2003, Park HC; 1♀, Dongmakgol Mt. Surisan Gunpo-si, 4 VI 2005, Lee JG; 1♂, Wonheung Taebong-ri Sang-myeon Gapyeong-gun, 24 VI 2006, Lee JG. **[GW]** 1♀, Gangchon-ri Namsan-myeon Chuncheon-si, 22 V 1977, Han HY; 1♀, Mapyeong-ri Jinbu-myeon Pyeongchang-gun, 30 VI 1985, Lee EY; 1♂, Deokchi-ri Dong-myeon Hongcheon-gun, 19 V 1996, Jung KI and Ham JS; 1♀, Gugok *falls* Gangchon-ri Namsan-myeon Chuncheon-si, 15 V 2001, Sohn JC; 1♀, Dogwan-ri Naechon-myeon Hongcheon-gun, 24 V 2002, Lee HS; 1♀, Baekdamsa Yongdae-ri Buk-myeon Inje-gun, 25 V 2002, Yeo JD; 1♂, Changwon2-ri Nam-myeon Yeongwol-gun, 20 V 2003, Sohn JC. **[CB]** 7♂5♀, Yongwonjeosuji Songam-ri Sinni-myeon Chungju-si, 26 IV 2001, Kim WM. **[CN]** 1♂, Mt. Seongdusan Guseong-dong Yuseong-gu Daejeon-si, 25 V 1997, An SL; 1♂, Yugu-eup Gongju-si, 14 V 2001, Lee YB; 1♀, Mt. Deoksungsan Sacheon-ri Deoksan-myeon Yesan-gun, 3 V 2002, Sohn JC. **[JB]** 1♀, Seonunsa Samin-ri Asan-myeon Gochang-gun, 25 VI 1991, Kim JI; 1♂,

ibid., 27 VI 1992, Lee MS. **[GB]** 1♂, Icheon-ri Sangbuk-myeon Ulju-gun, 6 VI 1989, Anonym; 1♂, Mt. Juwangsan Naewon-dong Cheongsong-gun, 4 VI 1999, Anonym. **[GN]** 1♀, Mt. Wolasan Gajin-ri Jinseong-myeon Jinju-si, 22 V 1999, Lee SY.

10. *Agrilus spinipennis* Lewis
붉은가슴호리비단벌레
[Pls. I-i, V-h]

Agrilus spinipennis Lewis, 1893: 332 (Japan).

Korean records. ***Agrilus spinipnnis*** [sic]: Ishii, 1940: 46; ***A. spinipennis***: Cho, 1947: 69 (N. Korea); Ju, 1969: 114 (N. Korea); Kim and Nam, 1982: 152; Kim et al., 1994b: 157; An, 1997; Akiyama and Ohmomo, 2000: 277; An, 2001: 45; Ohmomo, 2004: 142; Jendek, 2006c: 402 (S. Korea).

Korean names. 느티나무긴구슬벌레(Ju 1969), 붉은가슴호리비단벌레(Kim et al. 1994b).

Description. Body length about 8.5-11.0 mm; subcylindrical, elongate about 3.7-3.9 times as long as wide. Dorsal side bicolorous; head and elytra blackish blue; pronotum yellowish green or yellowish red. Ventral side lustrous, yellowish green. Frons almost flat; vertex slightly grooved medially with longitudinal lines composed of small punctures; eyes large. Pronotum transverse, about 1.5 times as wide as long; sides acuminated to posterior margins; prehumeral carinae short and bent, not joined

pronotal marginal carinae. Scutellar transverse carina well developed. Elytra about 3.3 times as long as wide at humeri; apices slightly serrated with finely medial spine. Abdominal tergites III-V slightly grooved medially without cairnae; tergite VI almost flat without distinct groove or carina; tergite VII with distinct longitudinal median carina, not extending beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons blue green, more lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. **[Female]** Frons blackish brown, less lustrous; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad.

Distribution. Korea, China (Guandong & Hubei), Japan (Honshu, Shikoku, Kyushu & Tsushima), India (Kashmir) and Vietnam.

Host plants. *Zelkova serrata* 느티나무 (Akiyama & Ohomomo 1997).

Specimens examined. [GG] 1♀, Mt. Soyosan, 10 VI 1934, S Eguchi; 1♀, ibid., 19 V 1935, Anonym; 1♂, Mt. Dobongsan Dobong-gu Seoul-si, 30 V 1992, Kim SY; 1♀, ibid., 30 V 1992, Kim MJ; 1♀, Bogwangsa Gwangtan-myeon Paju-si, 21 VI 1997, Lee Y; 2♂, ibid., 18 VII 1998, Kim TW. **[CB]** 1♂, Mt. Songnisan Boeun-gun, 21 VI 1989, Kim SI. **[CN]** 1♀, Janggoksa Mt. Chilgapsan Cheongyang-gun, 14 ~ 23 V 2000, Hwang US, Go KH, Jung KH and Lee MJ, *ex*. FIT. **[JB]** 1♀, Baemsagol Mt. Jirisan Waun-ri Sannae-myeon Namwon-gun, 31 VII 1992, Park JS. **[JN]** 1♀, Yeongoksa Naedong-ri Toji-myeon Gurye-gun, 8 VII 1976, Lee GH.

11. *Agrilus subrobustus* E. Saunders

흰털호리비단벌레

[Pls. I-j, V-i]

Agrilus subrobustus E. Saunders, 1873: 516-517 (Japan). LT ♀ in NHM. See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus subrobustus alizziae***: Kurosawa, 1963b: 154; ***A. subrobustus***: Tôyama, 1985b: 22; Kim et al., 1994b: 157; Jendek, 1995a: 139-140 (S. Korea); Akiyama and Ohmomo, 1997: 40; Akiyama and Ohmomo, 2000: 277; Jendek, 2005: 20; Jendek, 2006c: 402 (S. Korea); ***A. sorocinus***: Hua, 2002: 90.

Korean name. 흰털호리비단벌레(Kim et al., 1994b).

Description. Body length about 4.3-5.4 mm; subcylindrical, robust to elongate about 3.1-3.6 times as long as wide. Dorsal side entirely olivaceous or bronze; elytra with stripe of white pubescence along sutural margin. Ventral side bronze with lustous. Head relatively large; frons slightly grooved medially; vertex slightly grooved medially with distinct spiral structure on both sides of medial groove; eyes large. Pronotum tapered, about 1.4 times as long as wide, and widest in basal part and lateral sides almost straight; anteromedial pronotal lobe prominent, projecting behind outline of anterior angles; disc strongly evenly convex, without lateral depressions; prehumeral carinae sharp, feebly elevated, projecting to basal third of pronotum, straight or slightly curved to marginal carina. Scutellar transverse carina well developed. Elytra about

3.6 times as long as wide at humeri; apices narrowly rounded separately. Abdominal sternite V slightly medially incurved. Sexual dimorphism not marked.

Distribution. Korea (South), China (Anhui, Fujian, Guizhou, Hubei, Hunan, Sichuan, Shaanxi & Yunnan), Japan (Honshu, Shikoku, Kyushu & Tsushima) and Taiwan.

Host plant. *Albizzia julibrissin* 자귀나무 (Akiyama & Ohmomo 1997).

Specimens examined. [CN] 1♂1?, Mt. Seongdusan Guseong-dong Yuseong-gu Daejeon-si, 22 VII 1993, An SL; 1ex., Mt. Baekhwasan Taean-eup Taean-gun, 6 VII ~ 25 VIII 2001, Park SJ and Shin CW; 1ex., Donam-ri Banpo-myeon, Gongju-si, 23 ~ 30 VIII 2005, Anonym, *ex*. Malaise trap. **[GN]** 1ex., Hansin *valley* Chuseong-ri Macheon-myeon Hamyang-gun, 30 VIII 1992, Anonym. **[JN]** 1ex., Baekyangsa Mt. Naejangsan Jangseong-gun, 15 ~ 24 VI 2000, Hwang US and Kim HJ; 1ex., Is. Geomundo Deokchon-ri Samsan-myeon, 31 VII 2004, Yoo IS.

12. *Agrilus ventricosus* Fairmaire

흐린무늬호리비단벌레

[Pl. I-k]

Agrilus ventricosus Fairmaire, 1888: 120-121 (China). LT ♀ in MNHN.

Agrilus toyamai Y. Kurosawa, 1985: 153, figs 4a-b (Japan). [syn. by Jendek 1995a: 144]

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus toyamai***: Kim and Kim, 1997: 128; ***A. venticosus*** [sic]: Akiyama and Ohmomo, 2000: 278; ***Agrylus*** [sic] ***toyamai***: Kim, 2002a: 245.

Korean name. 흐린무늬호리비단벌레(Kim & Kim 1997).

Descriptions. [Female] Body length about 10.7 mm; robust about 3.1 times as long as wide. Dorsal side lustrous, entirely bluish green; elytra with distinct three pairs of white tomentose spots. Ventral side lustrous, bluish green. Frons nearly flat; vertex slightly grooved medially with longitudinal lines composed of punctures; eyes small. Pronotum transverse, about 1.6 times as wide as long, widest at posterior third; disc almost flat, transversely rugoso with shallow median groove. Scutellar transverse carina well developed. Elytra about 2.8 times as long as wide at humeri, widest at posterior third; apices rounded, feebly serrate. Abdominal sternite V rounded apically.

Distribution. Korea (South), China (Beijing, Hebei & Nei Mongol) and Japan (Honshu).

Host plant. *Celtis jessoensis* 풍게나무 [= *Celtis bungeana* var. *jessoensis* (Kurosawa 1985; Akiyama & Ohmomo 1997)].

Specimens examined. [GW] 1♀, Binjidong Mt. Bangtaesan Misan-ri Sangnam-myeon Inje-gun, 25 VI 1996, Anonym.

Remarks. Only one female specimen was examined in this study. So, further studies and male specimens are needed.

13. *Agrilus yamawakii* Y. Kurosawa

검정호리비단벌레

[Pls. I-i, V-j]

Agrilus yamawakii Y. Kurosawa, 1957: 193-194, figs. 4.1-4 (Japan). HT ♂ in NSMT.

Korean records. ***Agrilus yamawakii***: Tôyama, 1985b: 24; Tôyama, 1989: 324; Kim et al., 1991b: 180; Kim et al., 1994b: 157; Akiyama and Ohmomo, 1997: 43; Akiyama and Ohmomo, 2000: 279: Hua, 2002: 91; Jendek, 2006c: 403.

Korean name. 검정호리비단벌레(Kim et al. 1994b).

Description. Body length about 6.9-8.9 mm; subcylindrical, elongate about 3.6-4.0 times as long as wide. Dorsal side mat; entirely blackish blue or black; elytra apices with sparse and indistinct whitish pubescence; abdominal tergites blackish blue or bluish violet. Ventral side bluish green, more lustrous than dorsum. Head moderate, slightly narrower than base of pronotum; frons almost flat; vertex longitudinally and strongly rugous, feebly grooved medially; eyes large. Pronotum transverse, about 1.5 times as wide as long and widest at the middle; sides subparallel, slightly rounded at the middle; posterior angles subrectangular, not produced; marginal carina slightly sinuate at the anterior half, rather straight at the posterior half. Scutellum transverse, bipartite by a strongly elevated carnia; the part before the carina subquadrate, about 4.0 times as wide as long, the part behind the carina wedge-shaped with the

median projection sharply projected. Elytra about 3.2 times as long as wide, widest at humeri. Abdominal tergite VI with indistinct median longitudinal carina; tergite VII with distinct median longitudinal carina, extending beyond posterior margin in the form of a blunt spine. **[Male]** Eyes large, more convex. Frons blackish blue with a lustrous. Frontal and prosternal pubescence dense and long. Last abdominal sternite slightly incurved apically. **[Female]** Eyes smaller, almost flat. Frons blackish brown with feebly coppery lustrous. Frontal and prosternal pubescence rather sparser and shorter. Last abodominal sternite rounded apically.

Distribution. Korea, Japan (Honshu, Shikoku, Kyushu & Tsushima) and Taiwan.

Host plants. *Zarthoxylum ailanthoides* (= *Fagara ailanthoides*) 머귀나무, *Z. mantchurica* (= *F. mantchurica*) 산초나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♂, Mt. Namsan Seoul-si, 5 VI 1934, S Eguchi; 1♂, ibid., 12 VI 1934, S Eguchi; 1♂, Mt. Yongmunsan Yongcheon-ri Okcheon-myeon Yangpyeong-gun, 25 VIII 1998, Kim SY; 1♂, Mt. Chungnyeongsan Sudong-myeon Namyangju-si, 24 VI 2000, Sohn JC; 1♀, Seodun-dong Gwonseon-gu Suwon-si, ? VI 2002, Park HC; 1♂, Mt. Mugapsan Gwangju-si, 10 VI 2005 (emergence), Kang W. **[GW]** 1♂, Myeongpa-ri Hyeonnae-myeon Goseong-gun, 10 VIII 1990, Kim JG; 1♂, ibid., 10 VIII 1990, Park HC; 1♂, Guryongsa Mt. Chiaksan Wonju-si, 15 VI 1999, Kim JI et al. **[CB]** 1♂, Daemok-ri Naesongni-myeon Boeun-gun, 10 VIII 1990, Kim BJ. **[GN]** 1♂, Mt.

Jirisan Jungsan-ri Sicheon-myeon Sancheong-gun, 30 VII 1980, Kim JI.

Subgenus *Agrilus* Curtis, 1825
호리비단벌레아속(신칭)

Agrilus Curtis, 1825: 67.

Type species: *Buprestis viridis* Linnaeus, 1758.

See Jendek (2006c) for more synonymy and references.

Diagnosis. Body length 4.0-11.0 mm. Frons slightly convex longitudinally and transversely, with weak impressions, except for *A. pecircai* Obenb. in which they are usually well developed. Vertex with straight or partly arcuate, punctate striae forming no distinct concentric pattern. Lateral pronotal impressions wide but shallow. Antero- and posteromedian pronotal impressions well pronounced, separated by transverse elevation. marginal and submarginal carinae slightly diverging anteriorly, closely converging to posterior 1/3-1/4 and occasionally almost contiguous in one point, then again diverging; submarginal carinae not reaching to posterior margin of pronotum; punctate pronotal striae always transverse or transversely arcuate. Elytra transversely convex, with sutural impressions weak but regularly developed along entire length. Last abdominal tergite without longitudinal median carina. **[Male]** Aedeagus rather wide, extremely rarely narrow, not very strongly sclerotized; tegmen usually distinctly widened to apical 1/3-1/4, with weakly sinuate lateral margins;

parameres arcuately or linearly tapering to narrowly or rather widely rounded apices, with unsclerotized bend of uniform width along entire lateral margin. Penis weakly sclerotized, without large apodeme sharply separated posteriorly from the rest of penis; mainly with rounded apex often bearing median papiliform process; terminal part of ejaculatory duct surrounded solely by basal ring-shaped structure.

Distribution. Palaearctic (European, Siberian, Mediterranean & Manchurian subregions) and Nearctic regions.

Key to the species of the subgenus *Agrilus*

1. Elytral apices slightly outwardly bent ····· ***suvorovi***
– Elytral apices not outwardly bent ····· **2**
2. Elytra with faint whitish pubescent vittae along the elytral suture, but sometimes completely vanished ····· **3**
– Elytra without distinct pubescent ····· **4**
3. Body length 5.5-6.5 mm; less produced posterior angles of pronotum; marginal carinae straight at basal half ····· ***viduus chiganicus***
– Body length 5.5-7.6; more produced posterior angles of pronotum; marginal carinae slightly bent at basal half ····· ***viduus subviduus***
4. Pronotum widest near anterior angles ····· **5**
– Pronotum widest at anterior third or middle ····· **6**
5. Prehumeral carinae faintly arched ····· ***ribesi***
– Prehumeral carinae straight ····· ***salicivola***
6. Prehumeral carinae abated and obtuse, rarely obsolets ····· ***cuprescens***

– Prehumeral carinae arcuate and distinst ····· ***viridis***

14. *Agrilus* (s. str.) *cuprescens* (Ménétriès)
구리빛호리비단벌레

Buprestis cuprescens Ménétriès, 1832: 154 (Azerbaijan). LT ♂ in ZIN.
See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus cuprescens***: Alexeev, 1989: 488 (N. Korea); Kim et al., 1994b: 156; Jendek, 2003b: 3-6 (N. Korea); Ohmomo, 2004: 141 (N. Korea); Ohmomo, 2006: 5.

Korean name. 구리빛호리비단벌레(Kim et al. 1994b).

Description. "Body length about 4.5-7.2 mm; body form varies from stout to slender regardless origin of specimens. Color range from bright to dark e.g.,: silky-green, olivaceous-green (Europe); cyaneous, violet (Europe, Turkey); bright blue (Caucasus - ssp. *amethystopterus*); cupreous (Ukraine, Kazakhstan); brown-green (Europe, Turkey, Transcaucasia, Siberia); dark brown (S Europe, Turkey, Siberia, Far East); blackish with blue tinge (Bulgaria); balckish with green tinge (Tuva); silky-black (Balkan, Far East); brightly bicolor with head and pronotum golden-cupreous, elytra from bright golden-green to dark brown, with green tinge (Eastern Turkey, Syria, Lebanon - ssp. chrysoderes). Dorsal side without distinct pubescence, sometimes with very narrow, whitish, adsutural strip in hind third of elytra. Fronto-vertex with or without

median sulcus, coarsely or finely (ssp. *amethystopterus*) rugoso-punctate. Pronotum widest in middle, rarely an anterior third, sides regularly arcuate, sometimes feebly incurved before basal angles; disk with deep or shallow lateral and medial pronotal impression; prehumerus abated and obtuse, rarely obsolete. Elytral apices widely and deeply separately arcuate or almost subtruncate. Mentonniere wide, arcuate or subtruncate, without corners." (Jendek 2003b).

Distribution. Korea, Russia (East Siberia, Far East & West Siberia), Mongolia, China, Japan (Hokkaido), Turkmenistan, Europe and Introduced to USA.

Host plants. *Rosa canina*, *Rubus caesius*, *R. fruiticosus* 서양오엽딸기 and *R. idaeus* (Bílý 2002); *Rosa rugosa* 해당화 (Ohmomo 2004).

Remarks. This species was reported for the first time in North Korea by Alexeev (1998) without particular records. The other records were just quotation from the record. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Jendek (2003b).

15. *Agrilus* (s. str.) *ribesi* Schaefer, 1946
리베호리비단벌레

Agrilus viridis ribesi Schaefer, 1946: 107-108 (France). LT (sex not examined) in MNHN.

Agrilus ribesi: Schaefer, 1968: 77-79.

Korean records. ***Agrilus ribesi***: Alexeev, 1989: 488 (N. Korea); Kim et al., 1994b: 157; Jendek, 2006c: 389 (N. Korea).

Korean name. 리베호리비단벌레(Kim et al. 1994b).

Description. "The lateral edge of pronotum is weakly emarginate at the posterior corners, which are of right angles. The small prehumeral pronotal carinae (in the posterior corners of pronotum) are blunt, short and faintly arched; their length is less than a quarter of the length of pronotum. The ends of elytra are elongated and slightly divergent. Bronze green, brownish green coloured species. Length: 6.5-8.0 mm." (Muskovits & Hegyessy 2002).

Distribution. Korea (North), Russia (West Siberia) and Europe.

Host plants. *Ribes alpinum*, *R. aureum*, *R. grossularia* 구우즈베리, *R. nigrum* 양가막까치밥나무, *R. rubrum* and *R. uva-crispa* (Bílý 2002).

Remarks. This species was reported for the first time in North Korea by Alexeev (1998) without particular records. The other records were just quotation from the record. I could not find Korean specimens in this study. According to Bílý (2002), this species is centraleuropean subendemic. But, this species is survived in the Korean list due to possibilities to discover in North Korea as further studies. So, further studies and Korean specimens are needed. Description followed Muskovits and Hegyessy (2002).

16. *Agrilus* (s. str.) *salicivola* Y. Kurosawa stat. nov.

애버들호리비단벌레(신칭)

Agrilus suvorovi salicivola Y. Kurosawa, 1963a: 106-107 (Japan). HT ♂ in NSMT.

Agrilus salicivola: Akiyama and Ohmomo 1997: 38.

Koran records. ***Agrilus salicivola***: Akiyama and Ohmomo, 1997: 38; Akiyama and Ohmomo, 2000: 275; ***Agrilus viridis***: Tôyama, 1985b: 23. [misid.]

Description. Length 5.8-7.2 mm, width 1.4-1.8 mm. Coloration variable, greenish-blue or cyaneous with pronotum somewhat tinged with green or rarely into black entirely. Different from *A. suvorovi* in the following points: Apex of elytra more bradly rounded, less swollen laterally, less caudate and prolonged, with the sutural angles obsoletely angulate but distinct (Kurosawa 1963a).

Distribution. Korea, Russia (East Siberia & Sakhalin), China and Japan (Hokkaido & Honshu).

Host plants. *Salix sachalinensis* and *S. yezoensis* (Akiyama & Ohmomo 1997).

Remarks. This species was reported for the first time in Korea by Akiyama and Ohmomo (1997) without particular records. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Kurosawa (1963a).

17. *Agrilus* (s. str.) *suvorovi* Obenberger, 1935 stat. nov.

버들호리비단벌레(개칭)

[Pl. II-a]

Agrilus suvorovi Obenberger, 1935: 165 (Russia). LT ♀ in NMP.

See Jendek (2006c) more synonymy and references.

Korean records. ***Agrilus suvorovi***: Kurosawa, 1963b: 153 (N. Korea); Ju, 1969: 114 (N. Korea); Kim et al., 1974: 221; Kim et al., 1994b: 157; Park, 1998: 46.

Korean names. 버들긴구슬벌레(Ju 1969), 버드나무비단벌레(Kim et al. 1974), 버들비단벌레(Kim et al. 1994b).

Description. [Female] Body length about 7.8 mm; subcylindrical, elongate about 3.7 times as long as wide. Dorsal side lustrous, almost glabrous; head, pronotum and abdominal laterosternites greenish brown; elytra dark greenish brown with very narrow, whitish adsutural strip in posterior third; abdominal tergites bluish violet, lustrous; abdominal laterosternites with faint whitish pubescence. Ventral side lustrous, almost the same color as dorsum, with faint whitish pubescence. Head slightly narrower than base of pronotum; frons slightly convex without median sulcus; vertex slightly grooved medially with straight or partly arcuate, punctate striae forming no distinct concentric pattern; eyes large; antennae serrate from the forth segment. Pronotum transverse about 1.5 times as wide as long, widest at anterior quarter; lateral margins regularly curved and slightly incurved before basal angles; antero- and posteromedian depressions well pronounced, separated by transverse elevation; prehumeral carinae short and feebly arcuate; submarginal carinae not merged with marginal carinae and not reaching to basal angles of

pronotum; scutellum transverse carina prominent. Elytra elongate about 3.1 times as long as wide, widest at posterior third; weak sutural impressions developed along entire length; apices somewhat divergent apically and each elytron slightly outwardly bent, and feebly serrate. Abdominal tergite III slightly grooved medially without carinae; tergites IV-VI without median grooves or carinae; tergite VII with fine longitudinal median carina, not extending beyond posterior margin; abdominal sternite V rounded apically.

Distribution. Korea, Russia (East Siberia, Far East & West Siberia), Mongolia, China (Heilongjiang, Shaanxi & Shanxi) and Europe.

Host plants. *Populus alba* 은백양, *P. candiensis*, *P. deltoides* 미류, *P. nigra*, *P. euramericana* 이태리포푸라, *P. tremula* (Bílý 2002).

Specimens examined. [??] 1♀, Mt. Taehwasan, 23 V 1982, Lee SW.

Remarks. Only one female specimen was examined in this study. So, further studies and male specimens are needed.

18-1. *Agrilus* (s. str) *viduus chinganicus* Obenberger
애흰줄호리비단벌레(신칭)

Agrilus chinganicus Obenberger, 1922: 27 (China). Syntypes in NMP.
Agrilus viduus chinganicus: Kurosawa 1957: 192.

Korean record. ***Agrilus viduus chinganicus***: Jendek, 2006c: 389.

Description. Body length 5.5-6.5 mm, width 1.5-1.9 mm. This species distinguished from the nominotypical species as follows: the smaller body

and the less produced posterior angles of the pronotum, and consequently the marginal carina is straight at the basal half (Kurosawa 1957).

Distribution. Korea, Russia (East Siberia & Far East), Mongolia and China (Beijing, Hebei, Nei Mongol, Sichuan, Shaanxi & Shanxi).

Host plant. *Ulmus wilsoniana* (Kurosawa 1957).

Remarks. This species was reported for the first time in Korea by Jendek (2006c) without particular records. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Kurosawa (1957).

18-2. *Agrilus* (s. str) *viduus subviduus* Y. Kurosawa

흰줄호리비단벌레(신칭)

[Pls. II-b, V-k]

Agrilus viduus subviduus Kurosawa, 1957: 192 (Japan). HT ♂ in NSMT.

Description. Body length about 5.5-7.6 mm; subcylindrical, elongate about 3.3-3.6 times as long as wide. Dorsal side lustrous, almost glabrous; head and pronotum blackish brown; elytra dull brown or dull reddish brown, with faint whitish pubescent vittae along the elytral suture, but sometimes completely vanished; abdominal tergites blackish brown, lustrous; abdominal laterosternites yellowish brown, lustrous with faint whitish pubescence. Ventral side entirely yellowish brown, lustrous with faint whitish pubescence. Head slightly narrower than the base of pronotum; frons feebly convex; vertex slightly grooved medially with

longitudinal lines composed of fine punctures; eyes large; antennae serrate from the fourth segment. Pronotum transverse about 1.4-1.6 times as wide as long, widest at the anterior third or the middle; lateral margins regularly arcuated, usually slightly incurved before basal anlges; antero- and posteromedian pronotal depressions well pronounced, separated by transverse elevation; scutellum bipartite by a elevated transverse carina; the anterior part rectagle, the posterior part wedge-shaped with the median projection sharply projected. Elytra elongate about 3.3 times as long as wide, widest at humeri; apices rounded apically, feebly serrate. Abdominal sternite V rounded apically. **[Male]** Frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad; prosternal process with dense and long pubescence. **[Female]** Frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad; prosternal process with sparse and short pubescence.

Distribution. Korea **(new record)** and Japan (Honshu, Kyushu & Tsushima).

Host plant. *Zelkova serrata* 느티나무 (Akiyama & Ohmomo 1997).

Specimens examined. **[GG]** 1♀, Mt. Myeongjisan Buk-myeon Gapyeong-gun, 7 VI 1992, Kim WS. **[JN]** 1♀, Dangchi Mt. Jirisan Naedong-ri Toji-myeon Gurye-gun, 5 VI 1998, Choi JC; 2♂, Junggeun-dong Gwangyang-si, 30-31 VIII 2000, An TH. **[GB]** 1♀, Buljeong *station* Daeseong-dong Jeomchon-si, 9 VI 1992, Anonym. **[GN]** 1♀, Mt. Misungsan Maechon-ri Yaro-myeon Hapcheon-gun, 29-30 VI 1998, Jeon JS. **[JJ]** 1♀, Mt. Sanbangsan Sagye-ri Andeok-myeon Namjeju-gun, 27 V 2005, Jung BH.

Remarks. According to Kurosawa (1957) different from the nominotypical

species by the follwing points: 1) The elytral pubescent vittae along the suture faint, sometimes completely vanished. 2) Prehumeral carinae shorter and more strongly curved. 3) Anterior margin of gulari lobe rounded not bilobed. This subspecies is newly recorded from Korea.

19. *Agrilus* (s. str.) *viridis* (Linnaeus)

검녹색호리비단벌레

[Pls. II-c, V-l]

Buprestis viridis Linnaeus, 1758: 410.

Agrilus vernadskii Obenberger, 1927: 15 (Russia). [syn. by Jendek 2002b: 4]

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus viridis***: Tôyama, 1989: 324; Kim et al., 1991: 180; Kim et al., 1994b: 157; Kim and Kim, 1997: 128; Kim, 2000: 133; Hua, 2002: 90-91; ***A. vernadskii***: Alexeev, 1989: 488 (N. Korea).

Korean names. 검녹색호리비단벌레(Kim et al. 1994b), 파란좀구슬벌레 (Boo et al. 2003).

Description. Body length about 6.9-7.3 mm; subcylindrical, elongate about 3.5-3.6 times as long as wide. Dorsal side lustrous, entirely glabrous, coloration variable; head, pronotum, elytra and abdominal laterosternites greenish brown, dark greenish brown, green or blue green; abdominal tergites dark blue, strongly lustrous; abdominal laterosternites with shining yellowish pubescence. Ventral side lustrous, almost the same color as

dorsum, with faint pubescence. Head slightly narrower than the base of pronotum; frons feebly convex without median sulcus; vertex feebly convex with fine median sulcus and longitudinal striae composed of fine punctures; eyes large; antennae serrate from the fourth segment. Pronotum transverse about 1.5 times as wide as long, widest at the middle; lateral margins somewhat subparallel, slightly incurved before basal angles; antero- and posteromedian depressions well pronounced, separated by transverse elevation; the former shallow and transverse, while the latter deep and narrow; lateral depressions rather deep; prehumeral carinae arcuate, reaching to posterior third, not conjoined with marginal carinae; marginal and submarginal carinae slightly diverging anteriorly, closely converging to posterior third, and then again diverging; submarginal carinae not reaching to basal angles; posternal process subparallel to just behind the anterior coxal cavities, and then acuminate to the apex; scutellum large, transverse carina prominent; the anterior part transversely rugose, subpentagular about 3.0 times as wide as long, the posterior part cuneiform, acute on tip. Elytra elongate, about 3.1-3.3 times as long as wide, widest at posterior third; humeral part slightly wider than pronotal base; elytral apices narrowly, separately rounded and feebly serrated. Abdominal tergites feebly convex, coarsely punctate; abdominal tergites V-VI without median carina; abdominal tergite VII with feeble or indistinct median longitudinal carina, not projecting beyond posterior margin; Abdominal sternite V rounded apically. **[Male]** Frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad; prosternal process with dense and long pubescence. **[Female]** Frontal

lateral margins weakly S-shaped between eyes, less narrowed anteriad; prosternal process with sparse and short pubescence.

Distribution. Korea, Russia (East Siberia, Far East & West Siberia), Mongolia, China (Beijing, Hebei & Jilin), Iran, Turkmenistan, Europe and North Africa.

Host plants. *Acer platanoides*, *A. pseudoplatanus*, *Alnus glutinosa*, *A. viridis*, *Betula pendula*, *B. pubescens*, *Carpinus betulus*, *Castanea sativa*, *Corylus avellana*, *Salix alba*, *S. aurita*, *S. capraea* 호랑버들, *S. cinerea*, *S. viminalis* 육지꽃버들 and *Tilia cordata* (Bílý 2002).

Specimens examined. [GG] 1♂1♀, Suwon-si, 25 X 1965, Anonym. **[GW]** 1♀, Mt. Bangtaesan Misan-ri Sangnam-myeon Inje-gun, 23 VI 1996, Kim JI and Kim SY. **[GB]** 1♂, Daehyeon-ri Seokpo-myeon Bonghwa-gun, 24 VII 1986, Jang GS.

Subgenus *Anambus* C. G. Thomson, 1864
긴호리비단벌레아속(신칭)

Anambus C. G. Thomson, 1864: 38; Bellamy 1996, 82 (subgen. rank).
Type species: *Buprestis biguttata* Fabricius, 1777.
Agrilus (*Anambus*): Bellamy, 1996: 82.

Diagnosis. Relatively large (8.0-16.0 mm). Eyes protruding beyond head contour. Frons with longitudinal median impression and smooth shining tubercles on either side between anterior 1/4 and 1/3; middle 1/3 with

large continuous transverse impression merging with longitudinal median one; sides in posterior 2/3 with smooth bolsters raised above eyes. Vertex with arcuate striae forming generally longitudinal, concentric pattern occasionally indistinct. Antero- and posteromedian pronotal impressions merging into one wide and deep longitudinal impression; or connected by weak, sometimes indistinct, narrow longitudinal impression in the middle of transverse elevation; pronotum without carinae at posterior corners; marginal carinae strongly S-shaped curved, more strongly in anterior half; submarginal carinae less curved, in posterior 1/3 very close to marginal ones, not reaching to posterior margin of pronotum. Posterior prosternal process in both sexes without brush of white shining setiform scales. Last abdominal tergite with median longitudinal carina disappearing apicad. **[Male]** Aedeagus narrow, strongly sclerotized; parameres and anterior part of tegminal tube bearing on inner and on part of outer surface short obtuse microscopic spines and short thick setae clearly visible at 600× magnification. Penis strongly sclerotized, with robust apodeme arcuately narrowed toward the rather narrowly rounded apex and with semi-oval excision on posterior margin. Basal ring-shaped structure, surrounding terminal part of ejaculatory duct, anteriorly and laterally, or distinctly only laterally, bordered by small sclerites bearing two sclerotized cords adjacent to ejaculatory duct or rather distant form it; semi-oval area lying under apodemal arch at terminal structures bears strongly arcuately curved rows of rather dense groups of minute, sclerotized rod-shaped structures parallel to each other but perpendicular to the row axis, or flabelliform arranged.

Distribution. Palaearctic (European, Mediterranean & Manchurian subregions) and Nearctic regions.

20. *Agrilus* (*Anambus*) *cyaneoniger* E. Saunders
긴호리비단벌레(개칭)
[Pls. II-d, VI-a]

Agrilus cyaneoniger E. Saunders, 1873: 515 (Japan). LT ♂ in NHM.
Agrilus cyaneoniger mikado Obenberger, 1924: 35-36 (Japan).
Agrilus melanopterus Solsky, 1875: 277-279 (Russia).
See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus cyaneoniger***: Kurosawa, 1963b: 153; Cho, 1967: 194; Ju, 1969: 113 (N. Korea); Kim, 1981: 343; Kim and Nam, 1984: 87; Kim et al., 1985: 105; Tôyama, 1985b: 22-23; Alexeev, 1989: 478-479 (N. Korea); Chang and Choe, 1992: 318 (Mt. Baekdusan); Park et al., 1993: 179; Kim et al., 1994a: 147; Jendek, 1995: 140-141; Kim, 1995a: 166; An, 1998: 37; Akiyama and Ohmomo, 2000: 271-272; An, 2001: 45; Hua, 2002: 89; An, 2004: 42; Kim et al., 2004: 117; Jendek, 2006c: 390 (N. Korea); ***A. cyaneoniger mikado***: Kim et al., 1974: 221; ***A. cyuneoniger*** [sic]: Kim, 1978: 101; Kim and Nam 1982: 152; Nam and Kim, 1983: 128; Park and Cho, 1986: 127; ***A. cyaneoniger melanopterus***: Tôyama, 1989: 323; Kim et al., 1994b: 156; Kim and Kim, 1996: 48; Akiyama and Ohmomo, 1997: 31-32; Kim and Kim, 1998: 171; Lee et al., 1998: 41; Park, 1998: 46; Kim et al., 2002: 120;

Hua, 2002: 89; ***A. cyaceonier*** [sic]: Won et al., 1990: 145 (Mt. Baekdusan);

Korean names. 검정긴구슬벌레(Ju 1969), 보라가슴비단벌레(Kim et al. 1974), 검정길쭉비단벌레(Kim 1978), 가시나무비단벌레(Kim et al. 1985).

Description. Body length about 8.7-14.5 mm; sybcylindrical, remarkably elongate about 3.7-4.1 times as long as wide. Dorsal side lustrous, almost glabrous, coloration variable; head and pronotum black, bluish black, carmine, golden green or golden orange; elytra black, bluish black or dark grayish green; abdominal tergites bluish violet; abdominal laterosternites with faint yellowish pubescence. Ventral side lustrous, dull greenish brown or greenish brown without distinct pubescence. Head distinctly narrower than base of pronotum; frons with deep median sulcus and large continuous transverse depression merging with median sulcus; vertex strongly grooved medially with concentric pattern of punctate; eyes large; antennae serrate fron the fourth segment. Pronotum transverse about 1.5 times as wide as long, widest at posterior third; lateral margins evenly arcuate; disc with entire longitudinal median groove well pronounced, without transverse elevation; prehumeral carina absent; marginal- and submarginal carinae merged before posterior margin of pronotum; prosternal process linguiform; scutellem reduced and sunk centrally, without transverse carina. Elytra elongate about 2.8-3.0 times as long as wide, widest at humeri; elytral apices rounded, feebly serrate. Abdominal tergites III-V slightly grooved medially without carinae; tergite VI with fine longitudinal median carina; tergite VII with distinct

longitudinal median carina, not extending beyond posterior margin; abdominal sternite V rounded apically. **[Male]** Frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Meso and meta femora with dense and long white pubescence. **[Female]** Frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Meso and meta femora with short and sparse white pubescence.

Distribution. Korea, Russia (Far East), China (Guizhou, Hainan, Hebei, Jilin, Jiangxi, Nei Mongol, Sichuan, Shaanxi, Shanxi, Yunnan & Zhejiang), Japan, India (Kashmir) and Vietnam.

Host plants. *Quercus acutissima* 상수리나무, *Q. mongolica* var. *grosseserrata*, *Q. serrata* 졸참나무 and *Q. variabilis* 굴참나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♂, Mt. Namsan Seoul-si, 28 VI 1933, S Eguchi; 1♀, Mt. Soyosan, 10 VI 1934, S Eguchi; 1♂, Bogwangsa Gangtan-myeon Paju-si, 16 VI 1978, Lim JH; 1♀, Pyeonbaek Bonghwa-ri Samdong-myeon Namhae-gun, 21 VI 2001, Seol JH; 1♀, Mt. Yebongsan Wabu-eup Namyangju-si, 5 VI 2004, Ryu JW. **[GW]** 1♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 30 VI 2004, Lee JG. **[CB]** 1♀, Yonggok Mt. Gyemyeongsan Yongtan-dong Chungju-si, 17 VI 2003, Han GD and Kim TW.

Subgenus *Dentagrilus* Alexeev, 1998

청호리비단벌레아속(신칭)

Agrilus (*Dentagrilus*) Alexeev, 1998: 377.

Type species: *Buprestis coerulea* P. Rossi, 1792 (= *Buprestis cyanescens* Ratzeburg, 1837).

Diagnosis. Body length 3.5-7.6 mm. Eyes distinctly protruding beyond head contour. Frons with weakly curved, lateral margins between eyes, narrowed anteriad, rarely nearly parallerl-sided, rather weakly convex, often with rounded flattening in central 2/4; commonly with well developed entire median longitudinal impression, very rarely without any. Vertex with punctate striae forming concentric pattern. Anterior and posterior longitudinal pronotal impressions commonly shallow, transverse, rarely rather deep, anterior one occasionally indistinct; carinae at posterior coners of pronotum usually short, very rarely merged with those at anterior corners; marginal and submarginal carinae moderately or strongly converging to posterior 1/4, extremely rarely contiguous or merged; submarginal carinae not reaching to posterior margin of pronotum. Anterior margin of prosternal collar with arcuate excision commonly bordered on each side by a denticle or angle, rarely by a curve. **[Male]** Last abdominal sternite roundly trapezoidal, with weakly arcuately excised or truncate apex. Aedeagus with strongly sclerotized tegmen widened anteriad in posterior half. Penis strongly sclerotized; with apodeme formed by more sclerotized lateral areas separated by narrow, narrowing apically, less sclerotized interval; lateral edges of penis in anterior half or nearly to base with large thick dents pointed to penis base. Penis rarely very wide or narrow; sharp, commonly obtusely rounded apex terminally

wide and short, flattened or rounded, weakly drawn out, very rarely strongly drawn out and narrow, rather acute; anterior 1/2 or central 2/4 of penis with a complex structure around and before both terminal part of ejaculatory duct and basal ring-shaped structure, forming bottle-shaped, elongate-oval, or bullet-shaped chamber covered, before apex of ejaculatory duct, with flat recumbent scales. **[Female]** Last abdominal sternite with arcuately, broadly rounded apex sometimes narrowly obtuse in the middle, rarely narrowly truncate.

Distribution. Palarearctic (European & Manchurian subregions) and Nearctic (introduced) regions.

Key to the species of the subgenus *Dentagrilus*

1. Vertex slightly grooved medially; Pronotum widest at posterior third, with shallow anterior depression ····· ***asahinai***
− Vertex strongly grooved medially; Pronotum widest at middle, without anterior depression ····· **2**
2. Pronotum with indistinct or obsolete prehumeral carinae ····· ***pooli***
− Pronotum with distinct prehumeral carinae ····· ***cyanescens***

21. *Agrilus* (*Dentagrilus*) *asahinai* Y. Kurosawa

애청호리비단벌레(신칭)

[Pls. II-e, VI-b]

Agrilus asahinai Y. Kurosawa, 1956: 38-40, fig. 2a-d (Russia). HT ♂ in NSMT.

See Jendek (2006c) for more synonymy and references.

Description. Body length about 5.3-6.3 mm; subcylindrical, robust about 2.9-3.1 times as long as wide. Dorsal side entirely lustrous, glabrous; head dark grayish green (male) or blue green (female); pronotum and elytra blue green; abdominal tergites dark blue, lustrous; abdominal laterosternites blue green without distinct pubescence. Ventral side dark blue, less shining than dorsum. Head almost the same width as base of pronotum; frons convex with obsolete median sulcus; vertex strongly grooved medially with punctate striae forming concentric pattern; eyes small; antennae serrate from the fourth segment. Pronotum transverse about 1.6 times as wide as long, widest at posterior third; sides rounded, expanded from base to posterior third, then slightly arcuately attenuate to basal angles; disc moderately convex with shallow anterior transverse median depression and posterior longitudinal median depressions; prehumeral carinae obsolete or obliterate; submarginal carina not merged with marginal carina, and not reaching to basal angles; prosternal process deplanate, slightly constricted by the anterior coxal cavities, and acute and produced at the apex. Scutellum transverse, truncate in front, sharply projected and cuneiform posteriorly, and transversely carinaete at the middle. Elytra 2.5 times as wide as long, widest just behind the middle or at the posterior 3/5; elytral apices separately rounded and indistinctly serrate. Abdominal tergites III and IV slightly grooved medially without

carina; tergites V and VI almost flattened without carina and groove; tergite VII with distinct longitudinal median carina, not extending beyond posterior margins. **[Male]** Frons golden green; frontal lateral margins more narrowed anteriad. Abdominal sternites I and II somewhat flat with shallow longitudinal median groove; abdominal sternite V strongly incurved apically. **[Female]** Frons blue green; frontal lateral margins less narrowed anteriad. Abdominal sternites I and II feebly convex without longitudinal median groove; abdominal sternite V slightly incurved apically.

Distribution. Korea **(new record)**, Russia (Far East), China (Heilongjiang), Japan (Honshu).

Host plant. Unknown.

Specimens examined. [CN] 1♀, Is. Anmyeondo Taean-gun, 8 V 2003, An SL; 1♂, ibid., 6 VI 2003, An SL; 4♂2♀, ibid., 23 V 2004, An SL. **[JB]** 1♂, Sojaeji Sangseo-myeon Buan-gun, 20 V 1992, Yoon HJ; 1♂, Junggye-ri Byeonsan-myeon Buan-gun, 21 V 1992, Yoon HG; 1♂, Daebul-ri Seolcheon-myeon Muju-gun, 26 V 1993, Park JM.

Remarks. This species is firstly recorded from Korea.

22. *Agrilus* (*Dentagrilus*) *cyanescens* (Ratzeburg)

청호리비단벌레(신칭)

[Pls. II-f, VI-c]

Buprestis cyanescens Ratzeburg, 1837: 54-55. TL not given, but presumably Germany as indicated from the title: "Wäldern Preufsens" (Jendek 2002c).

See Jendek (2006c) for more synonymy and references.

Description. Body about length 5.7-7.1 mm; subcylindrical, robust about 3.1-3.3 times as long as wide. Dorsal side entirely lustrous, glabrous and concolorous; head, pronotum, elytra and abdominal laterosternites blue green, deep blue or dull green; abdominal tergites deep blue, lustrous. Ventral side almost the same color as dorsum with faint pubescence. Head slightly narrower than base of pronotum; frons and especially vertex, grooved medially, vertex with concentric lines of small punctures; eyes small. Pronotum transverse, about 1.6 times as wide as long with a lobate anterior margin and regularly curved lateral margins; medial pronotal groove indistinct. Scutellar transverse carina feeble. Elytra about 2.7 times as long as wide at humeri, slightly acuminate at posterior third; apices separately rounded. Abdominal sternite V strongly incurved apically. **[Male]** Antennae somewhat longer, their medial segments rather serrata. Eyes rather large. Abdominal sternite V slightly serrate apically. **[Female]** Antennae shorter, their medial segments less serrata. Eyes smaller. Abdominal sternite V smooth apically.

Distribution. Korea **(new record)**, Russia (East Siberia, Far East, West Siberia) and Europe.

Host plants. *Lonicera coerulea*, *L. implexa*, *L. nigra* 암괴불나무, *L. racemosa*, *L. xylosteum* and *Rhamnus cathartica* (Bílý 2002).

Specimens examined. [GG] 1♀, Mt. Cheonggyesan Seoul-si, 23 V 2004, Kim YR. **[GW]** 1♀, Bukdaesa Mt. Odaesan Dongsan-ri Jinbu-myeon Pyeongchang-gun, 28 V 1998, Park SW; 1♀, Gugok *falls* Gangchon-ri

Namsan-myeon Chuncheon-si, 14 VI 2001, Sohn JC. **[JN]** 1♀, Nogodan Mt. Jirisan Gurye-gun, 13 VII 1969, Anonym. **[GB]** 1♀, Bulyeong *valley* Uljin-gun, 14 V 1993, Jung MH; 1♂, Danggol Mt. Juwangsan Haui-ri Budong-myeon Cheongsong-gun, 16 V 1999, An SL; 1♀, Mt. Baegamsan Uljin-gun, 28 ~ 29 V 1999, Song SJ; 1♀, ibid., 29 V 1999, Ahn EG; 1♀, ibid., 29 V 1999, Kang HG; 1♀, ibid., 29 V 1999, Woo SH; 1♂, Mt. Baegamsan Onjeong-myeon Uljin-gun, 29 V 1999, Han TM. **[GN]** 1♀, Mt. Gajisan Sangbuk-myeon Ulju-gun, 28 V ~ 1 VII 1990, Kim MJ; 1♀, ibid., 28 V ~ 1 VII 1990, Lee YS; 1♂1♀, Mt. Sanseongsan Yongtae-ri Hail-myeon Goseong-gun, 5 V 2000, Gu YJ; 1♂, ibid., 5 V 2000, Kim ES; 1♀, ibid., 5 V 2000, Kim DI.

Remarks. This species is firstly recorded from Korea.

23. *Agrilus* (*Dentagrilus*) *pooli* Théry
북청호리비단벌레(신칭)

Agrilus pooli Théry, 1936: 120-121 (Russia).

Korean records. ***Agrilus pooli***: Alexeev, 1989: 483 (N. Korea); Jendek, 2006c: 390 (N. Korea).

Description. Body length about 5.8-6.8 mm; subcylindrical, elongate about 3.0 times as long as wide. Dorsal side lustrous, entirely grabrous; head dark blue; pronotum, elytra and abdominal laterosternites deep blue. Head slightly narrower than base of pronotum; frons with distinct median sulcus; vertex strongly grooved medially with punctate striae forming

concentric pattern; eyes small. Pronotum transverse about 1.6 times as wide as long, widest at middle; sides regulaly arcuated; disc convex, anterior part very convex without median depression and posterior part with shallow longitudinal median depressions; prehumeral carinae almost indistinct; scutellum transverse, truncate in front, sharply projected and cuneiform posteriorly, and transversely carinaete at the middle. Elytra 2.6 times as wide as long, widest at posterior third; apices separately rounded and indistinctly serrate.

Distribution. Korea (North) and Russia (Far East).

Host plant. honeysuckle [*Lonicera* sp.] (Alexeev 1989).

Remarks. This species was reported for the first time in North Korea by without particular records. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Alexeev (1998).

Subgenus *Orientagrilus* Alexeev
흑람색호리비단벌레아속(신칭)

Agrilus (*Orientagrilus*) Alexeev, 1998: 379.

Type species: *Agrilus tempestivus* Lewis, 1894.

Diagnosis. Body length 4.0-6.4 mm. Body narrow, 3.8-4.0 times as long as wide. Eyes protruding beyond overall head contour. Frons with more or less S-shaped lateral margins between eyes, weakly and irregularly

convex, in central part somewhat flattened; in anterior 1/3 with or without median impression, in posterior half usually with very shallow oblique impressions running toward lateral margin, at posterior margin with very weak and shallow lateral impressions. Vertex with punctate striae forming concentric pattern. Antero- and posteromedian pronotal impressions weak, rarely foveiform, separated by transverse elevation, often with obsolete narrow longitudinal sulcus; carinae at posterior corners merged anteriorly with marginal carinae; marginal and submarginal carinae slightly diverging in anterior 1/3, closely converging or merged at one point at posterior 1/4, marginal carina farther again separated from submarginal one but terminating close to posterior margin of pronotum; posterior pronotal angles acute, slightly drawn out. Last abdominal tergite with median longitudinal carina. **[Male]** Aedeagus very strongly sclerotized, rather narrow; tegmen linearly widened to anterior 1/3; parameres linearly or somewhat arcuately strongly narrowing to very narrowly rounded apices. Penis strongly sclerotized, more strongly in anterior part, with high and large apodeme, very wide, in posterior 2/5 with straight parallal lateral margin, farther weakly arcuately narrowed to apical 1/3, with straight and parallel lateral margins there; apex widely rounded laterally, with wide semi-circular incision in the middle; terminal part of ejaculatory duct with very large basal structure occupying entire space between lateral edges of penis.

Distribution. Palaearctic region (Manchurian subregion).

24. *Agrilus* (*Orientagrilus*) *tempestivus* Lewis

흑람색호리비단벌레

[Pls. II-g, VI-d]

Agrilus tempestivus Lewis, 1893: 334-335 (Japan). LT ♂ in NHM.

Korean records. ***Agrilus tempestivus***: Cho, 1967: 194; Tôyama, 1985b: 29; Tôyama, 1989: 324; Kim et al., 1994b: 157; An, 1996: 37; Park, 1998: 46; Akiyama and Ohmomo, 2000: 277; An, 2004: 42; ***A. temestivus*** [sic]: An, 1998: 37.

Korean name. 흑람색호리비단벌레(Kim et al. 1994b).

Description. Body length about 5.0-6.5 mm; subcylindrical, elongate about 3.7-3.8 times as long as wide. Dorsal side entirely lustrous, glabrous, mainly concolorous, rarely bicolorous; head and pronotum blue green, dark grayish green, dull green or greenish brown; elytra and abdominal laterosternites dark grayish green, dull green or greenish brown; elytra and abdominal laterosternites with faint white pubescence; abdominal tergites blackish blue, lustrous. Ventral side dark grayish green, dull green or greenish brown, lustrous, with faint pubescence (female more sparser than male). Head slightly narrower than the base of pronotum; frons feebly convex, slightly grooved medially; vertex slightly grooved medially, with punctate striae forming concentric pattern; antennae serrate from the fourth segment; eyes large. Pronotum transverse about 1.4 times as wide as long, widest in apical half; lateral margins strongly incurved before posterior angles, posterior angles obviously sharp. Prehumeral

carinae strongly elevated, extending from posterior angles to middle of pronotum, and merged with marginal carina behind pronotal half; medial groove divided into a shallow transverse anterior depression and an elongate posterior depression; scutellum transverse carina well developed. Elytra elongate about 3.1 times as long as wide at humeri; apices rounded apically, feebly serrate. Abdominal tergite VII with distinct medial carina but disappear near posterior margin; abdominal sternite V rounded apically. **[Male]** Prosternal pubescence dense and long. Abdominal sternites I and II are distinctly grooved medially with two knolls. **[Female]** Prosternal pubescence sparse and short, almost indistinct. Abdominal sternites I and II are not grooved medially.

Distribution. Korea (South), Russia (Far East), China (Hebei, Liaoning & Nei Mongol) and Japan (Honshu, Shikoku, Kyushu & Tsushima).

Host plants. *Carpinus* spp., *Machilus thunbergii* 후박나무 and *Quercus* spp. (Akiyama & Ohmomo 1997).

Specimens examined. **[GG]** 1♀, Geumhyeonsoryuji Geumhyeon-ri Soheul-eup Pocheon-gun, 11 VI 2006, Lee JG; 1♀, Mt. Myeongjisan Buk-myeon Gapyeong-gun, 25 VI 2006, Na SH. **[GW]** 1♀, Eoheul-ri Seongsan-myeon Gangneung-si, 29 VI 2003, Yoo IS. **[CB]** 1♂, Mt. Minjujisan Mulhan-ri Sangchon-myeon Yeongdong-gun, 4 VI 2000, Kim WM. **[CN]** 1♀, Donghaksa Mt. Gyeryongsan Hakbong-ri Banpo-myeon Gongju-si, 1-18 VI 2004, Choi SM and Park JS, *ex*. FIT; 1♂1♀, Nammaetap Mt. Gyeryongsan Banpo-myeon Gongju-si, 1-18 VI 2004, Choi SM and Park JS, *ex*. FIT. **[GB]** 1♂, Mt. Hwanghaksan Mungyeong-eup Mungyeong-si, 4 VI 1978, Lee UB; 1♂, Jikjisa Mt.

Hwanghaksan Mungyeong-eup Mungyeong-si, 6 V 1978, Yun DG; 1♀, Huibang *valley* Mt. Sobaeksan Punggi-eup Yeongju-si, 24 VII 2004, Lee JG. **[JB]** 1♂, Gucheondong Dugil-ri Seolcheon-myeon Muju-gun, 10 VI 1972, Ryu JH; 1♂1♀, Mt. Seonunsan Asan-myeon Gochang-gun, 6 VI 2004, Seung JB. **[JN]** 1♂, Mt. Duryunsan Samsan-myeon Haenam-gun, 23 VI 1993, Lee MA; 1♂, Piagol Mt. Jirisan Toji-myeon Gurye-gun, 4 VI 1998, Byun YJ; 1♀, Piagol Mt. Jirisan Toji-myeon Gurye-gun, 22 V 1999, Han TM; 1♂1♀, Mt. Jjotbitsan Dosa-ri Daap-myeon Gwangyang-gun, 31 V 2003, Ahn TH; 3♀, Saangam-dong Jeongeup-si, 20 VI 2005, Kim KB, *ex*. Malaise trap.

Subgenus *Pseudoquercagrilus* Alexeev, 1998
아세아호리비단벌레아속(신칭)

Agrilus (*Pseudoquercagrilus*) Alexeev, 1998: 378.

Type species: *Agrilus asiaticus* Kerremans, 1898.

Diagnosis. Body length 6.3-8.0 mm. Body narrow, 3.8-4.0 times as long as wide, slightly longitudinally convex. Eyes somewhat protruding beyond head contour. Frons not very convex, weakly narrowing anteriad, with S-shaped lateral margins and very feeble impression. Vertex strongly longitudinally convex, with punctate striae forming concentric pattern. Pronotum with narrow shallow lateral impressions; anteromedian impression transverse and shallow, posteromedian one elongate; posterior

corners with gently arcuately curved, rather high carinae extending to 1/3 pronotum length; marginal and submarginal carinae converging posteriad; submarginal carinae not reaching to posterior margin of pronotum. Posterior prosternal process with a brush of white shining setiform scales. Last abdominal tergite with longitudinal median carina forming, together with drawn-out margin of tergite apex, a trapezoidal process with somewhat arcuately excised apex. **[Male]** Aedeagus with strongly sclerotized tegmen, directly widened anteriad to anterior 1/3; with strongly arcuately excised lateral margins of parameres sharply narrowed to very narrow apices. Penis strongly sclerotized, with short apodeme, straight lateral margins, and obtuse apex weakly excised at tip; anterior and lateral to ejaculatory duct with wide, strongly sclerotized cords parallel anteriorly, then diverging to lateral edges of penis and running posteriad along them nearly to base of penis; terminal part of ejaculatory duct surrounded by basal ring-shaped structure.

Distribution. Palaearctic region (Mediterranean & Manchurian subregions).

25. *Agrilus* (*Pseudoquercagrilus*) *asiaticus* Kerremans

아세아호리비단벌레

[Pls. II-h, VI-e]

Agrilus asiaticus Kerremans, 1898: 178 (China). LT ♂ in NHM.

Agrilus planefasciatus Obenberger, 1936: 115. [syn. by Kurosawa 1976: 132-133]

Korean records. ***Agrilus asiaticus***: Kurosawa, 1963b: 153; Kurosawa, 1976: 132-133; Tôyama, 1985b: 29; Jendek, 1994: 14-15; Kim et al., 1994b: 156; Akiyama and Ohmomo, 1997: 29; Akiyama and Ohmomo, 2000: 270; An, 2003: 44; Kim et al., 2004: 117; Jendek, 2006c: 391; ***A. planefasciatus***: Ju, 1969: 114 (N. Korea); Chang and Choe, 1992: 318 (Mt. Baekdusan).

Korean names. 먹풀긴구슬벌레(Ju 1969), 아세아호리비단벌레, 상수리긴비단벌레(Kim et al. 1994b).

Description. Body length about 5.8-9.3 mm; subcylindrical, elongate about 4.0 times as long as wide in male. Dorsal side lustrous, almost glabrous; mainly bicolorous, rarely concolorous; head and pronotum greenish brown or dark grayish green, mostly brighter than elytra; elytra greenish brown, dark grayish brown or dark grayish green; elytral apices with sparse and short whitish pubescence; abdominal tergites greenish brown or yellowish brown. Ventral side lustrous, greenish brown, dark greenish brown or dark grayish green. Head moderate, the same width as the base of pronotum; eyes large; frons slightly convex, with the longitudinal median line obsoletely impressed; vertex slightly grooved medially, with punctate striae forming concentric pattern. Pronotum transverse, about 1.3 times as wide as long and widest at anterior third or the middle; medial pronotal groove divided into a shallow anterior transverse depression and a posterior elongate depression. Scutellar transverse carina well developed. Elytra about 3.3 times as long as wide at base, slightly acuminate in posterior third; apices strongly serrated. Abdominal tergite VI strongly depressed in medially without longitudinal carina; tergite VII with

longitudinal median carina, extending beyond posterior margin in the form of a blunt spine; abdominal sternite V rounded apically. **[Male]** Prosternal process with dense and long whitish pubescence. Abdominal sternites I and II distinctly grooved medially with yellowish pubescence. **[Female]** Prosternal process with short and sparse whitish pubescence. Abdominal sternites I and II not grooved medially.

Distribution. Korea, Russia (Far East) and China (Beijing, Hebie, Jiangxi, Sichuan & Shaanxi).

Host plants. *Quercus acutissima* 상수리나무 and *Q. variabilis* 굴참나무 (Kurosawa 1963a; Akiyama & Ohmomo 1997).

Specimens examined. **[GG]** 1♀, Suwon-si, 12 VI 1957, Anonym; 1♀, ibid., 4 VII, 1958, Anonym; 1♀, ibid., 4 VI 1988, Anonym; 1♀, Bogwangsa Gwangtan-myeon Paju-si Gyeonggi-do, 18 VI 1977, Kim YH; 1♂, Ui-dong Gangbuk-gu Seoul-si, 17 V 1978, Lee WB; 1♀, Mt. Dobongsan, 4 VIII 1982, Yoo DH; 1♂, Cheongpyeong Gapyeong-gun, 31 V 1986, Jeong JH; 1♀, Mt. Cheonggyesan, 7 VI 1986, Kim SH; 1♂, Yongin-si, 21 VI 1986, Paik WH; 1♀, Mt. Yawolsan Yeoncheon-gun, 26 VI 1987, Yoo HJ; 1♀, Mt. Gwanaksan, 29 VI 1987, Kim DJ; 1♀, Namhansanseong Jungbu-myeon Gwangju-si, 4 VI 1994, Lee J; 1♂, Yeoncheon-gun, 24 V 1995, Sohn JC; 1♀, Cheongdam *park*, Gangnam-gu Seoul-si, 7 VI 1997, Jung CH. **[GW]** 1♂, Samhwasa Bukpyeong-dong Donghae-si, 27 VI 1984, Jang GS; 1♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 25 VI 2005, Lee JG. **[CB]** 1♂1♀, Yeomchigogae Cheongwon-gun, 28 V 1991, Kim JI; 1♀, Ssanggok *valley* Ssanggok-ri Chilseong-myeon Goesan-gun, 26 VI 2002, Kim MA.

[CN] 1♀, Mt. Gyeryongsan Gongju-si, 11 VII 1995, Jeong GS; 1♂, Mt. Bonghwasan Boryeong-si, 18 V 1997, Park HC; 1♀, Hanseo Univ. Haemi-myeon Seosan-si, 4 VII 2001, Kim MA; 1♀, Chungnam Univ. Yuseong-gu Daejeon-si, 4 ~ 18 VI 2003, Choi JH, Lee DH and Choi SM, *ex*. FIT; 1♀, Donam-ri Banpo-myeon Gongju-si, 21 ~ 26 VI 2005, Anonym, *ex*. Malaise trap; 2♀, ibid., 13 ~ 19 VII 2005, Anonym, *ex*. Malaise trap; 1♀, ibid., 19 ~ 26 VII 2005, Anonym, *ex*. Malaise trap. **[JN]** 1♀, Mt. Baegunsan Dapgok-ri Ongnyong-myeon Gwangyang-si, 23 VI 1995, Jeong GS; 6♂4♀, Dapgok-ri Ongnyong-myeon Gwangyang-si, 17 III 1998 (breeding), Park SW; 1♀, Sanghwangbong Wando-gun, 1 VII ~ 29 VIII 2003, Park SJ and Shin CW, *ex*. FIT. **[GB]** 1♀, Jikjisa Mt. Hwanghaksan Gimcheon-si Daehangmyeon Unsu-ri, 4 VI 1978, Kim MG; 1♀, Dalgipokpo Cheongsong-gun Cheongsong-eup Woroe-ri, 24 VI 1988, Park EJ; 1♀, ibid., 5 VI 1989, Anonym; 1♀, Bohyeonsa Mt. Baekhwasan Sangju-si, 19 VI 2000, An SL; 1♀, Mt. Gyemyeongsan Jongmin-dong Chungju-si, 17 VI 2003, Kim JG and Yeo JD. **[GN]** 1♂, Icheon-ri Sangbuk-myeon Ulju-gun Ulsan-si, 27 ~ 30 VI 1988, Chae MH; 1♀, Icheon-ri Sangbuk-myeon Ulju-gun Ulsan-si, 27 VI 1989, Kim DS; 1♀, Bukmyeon *reservoir* Buk-myeon Changwon-gun, 14 ~ 20 VI 1992, Yeo SD; 1♀, Gahwa-ri Myeongsuk-myeon Jinyang-gun, 26 VI 1992, Anonym; 1♂, Manggol ~ Seodanggol Guncheon-ri Dongbu-myeon Geoje-gun, 24 VI 1994, Park JS; 1♀, Jeolgol Guncheon-ri Dongbu-myeon Geoje-gun, 25 VI 1994, Lee MG; 1♂, Dongbu-myeon Geoje-gun, 25 ~ 26 VI 1994, Yeo SD; 1♀, Guncheon-ri Dongbu-myeon Geoje-gun, 25 VI 1994, Chun JS; 1♀, Byeoksongsa Chuseong-ri

Macheon-myeon Hamyang-gun, 17 VI 1996, Anonym; 1♀, Mt. Waryongsan Waryong-dong Sacheon-si, 7 VI 1997, Chun JS; 1♀, Yeungnam Univ. Dae-dong Gyeongsan-si, 19 VI 1998, Baek YH; 1♀, Pyeonbaek Bonghwa-ri Samdong-myeon Namhae-gun, 16 VI 1999, Sohn JH; 1♂, ibid., 21 VI 2001, Kim HJ; 1♂, ibid., 21 VI 2001, Nam HW; 1♀, Mt. Sanseongsan Yongtae-ri Hail-myeon Goseong-gun, 5 V 2000, Kim DI; 1♀, Sinpung-ri Daepyeong-myeon Jinju-si, 15 VI 2001, Chun JS; 1♂, Dangchon-ri Daepyeong-myeon Jinju-si, 22 VI 2001, Park JS. **[JJ]** 1♂, Gwaneumsa Donam-dong Jeju-si, 17 VI 1973, Park JS; 1♀, Mt. Hallasan, 18 VI 1973, Park JS.

Subgenus *Quercuagrilus* Alexeev, 1998

참나무호리비단벌레아속(신칭)

Agrilus (*Quercuagrilus*) Alexeev, 1998: 372.

Type species: *Buprestis angustula* Illiger, 1803.

Diagnosis. Body length 3.5-9.0 mm. Frons narrowed anteriad, with S-shaped lateral margins; commonly strongly flattened, with feeble impressions. Vertex with straight or somewhat arcuately cured punctate striae forming no concentric pattern. Pronotum with entire longitudinal median impression; marginal and submarginal carinae merged before posterior end. Median longitudinal carina of last abdominal tergite developed to varied extent, occasionally indistinct. **[Male]** Second visible

abdominal sternite often with two small tubercles lateral to midline. Aedeagus primarily symmetric; tegmen widened apicad, rarely parallel-sided or narrow, in the last case often asymmetric because of hypertrophy and changed shape of right paramere. Penis commonly wide, parallel-sided, with galeate apodeme; terminal part of ejaculatory duct only with basal ring-shaped structure bearing two slightly diverging and gradually narrowing sclerotized cords.

Distribution. Palaearctic (European, Siberian, Mediterranean & Manchurian subregions), Oriental and Nearctic regions.

Key to the species of the subgenus *Quercuagrilus*

1. Elytra entirely covered with white pubescence except except a part of elytral posterior third ····· ***freibi***
− Elytra without distinct pubescence ····· **2**
2. Pronotum widest at anterior angles ····· ***fissus***
− Pronotum not widest at anterior angles ····· **3**
3. Prosternal process dilated ····· ***ribbei***
− Prosternal process not dilated ····· **4**
4. Elytral apices rounded apically ····· **5**
− Eltral apices not rounded apically ····· **6**
5. Middle sized (6.4-8.5 mm); Pronotal median groove more pronounced ····· ***adelphinus***
− Small sized (4.5-5.0 mm); Pronotal median groove less pronounced ····· ***ussuricola***

6. Pronotum widest at anterior third to middle; Elytral apices incurved each side ····· ***varius***

– Pronotum widest at anterior quarter; Elytral apices acuminate to elytral sutural margins ····· ***marginicollis***

26. *Agrilus* (*Quercuagrilus*) *adelphinus* Kerremans

참나무호리비단벌레(신칭)

[Pls. II-i, VI-f]

Agrilus adelphinus Kerremans, 1895: 222 (China). LT ♂ in MNHN.
See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus adelphinus***: Jendek, 1994: 14 (N. Korea); Ohmomo, 2002: 163; Ohmomo, 2004: 140-141; Ohmomo, 2006: 4-5; Jendek, 2006c: 391 (N. Korea).

Description. Body length about 6.4-8.5 mm; subcylindrical, elongate about 3.8 times as long as wide. Dorsal side feebly lustrous, almost glabrous, entirely concolorous; head, pronotum, elytra and abdominal laterosternites dark grayish green, blackish green or blackish brown; abdominal tergites blackish blue, lustrous; abdominal laterosternites with faint whitish pubescence. Ventral side lustrous, almost the same color as dorsum, with faint whitish pubescence. Head slightly narrower than base of pronotum; frons nearly flat with indistinct median sulcus; vertex with shallow median sulcus and longitudinal lines composed of small punctures; eyes

large; antennae serrate from the fourth segment. Pronotum transverse about 1.4 times as wide as long, widest near apical angles; lateral margins subparallel from apical angles to behind middle, then slightly narrowed to basal angles; disc with entire longitudinal median groove well pronounced, not separated by transverse elevation; prehumeral carinae arcuate, extending to near middle, not merged with marginal carinae; marginal- and submarginal carinae merged at posterior fourth, submarginal carinae terminating there; prosternal process linguiform, widely depressed. Scutellum transverse carina prominent. Elytra elongate about 3.2 times as long as wide, widest at the humeri; apices rounded, feebly serrate. Abdominal tergites III-VI slightly grooved medially without carinae; tergite VII with fine longitudinal median carina, not extending beyond posterior margin; abdominal sternite V strongly incurved apically. **[Male]** Frons yellow green; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Prosternum, metasternum, abdominal sternites I and II with dense and long whitish pubescence. Abdominal sternites I and II somewhat flat, with longitudinal median groove. **[Female]** Frons greenish brown; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Prosternum, metasternum and abdominal sternites I and II with sparse and short whitish pubescence. Abdominal sternites I and II rather convex, without longitudinal median groove.

Distribution. Korea, Russia (Far East), China (Anhui, Sichuan, Shaanxi, Shangdong, Shanxi, Xizang & Yunnan) and Japan (Hokkaido, Honshu & Kyushu).

Host plants. *Quercus* spp. (confirmed by the author).

Specimens examined. **[GG]** 1♀, Mt. Surisan, 18 VI 1977, Kim JH; 1♂, Anguk-dong Jongno-gu Seoul-si, ? V 1966, Noh YT; 1♂, Mt. Cheonggyesan Seocho-gu Seoul-si, 5 V 1988, Lee MY; 1♂, ibid., 17 VI 2000, Kim WM; 1♀, Gunpo-si, 11 VI 1988, Yoon SJ; 1♀, Mt. Cheonggyesan, 28 V 1989, Choe YJ; 1♂, Suwon-si, 21 V 1990, Han KH; 1♂, Mt. Surisan Anyang-si, 31 V 1992, Kim HJ; 1♂, Nokcheon Wolgye-dong Nowon-gu, 17 V 1997, Lee EM; 2♂, Jeongneungyuwonji Mt. Bukhansan Jeongneung4-dong Seongbuk-gu Seoul-si, 6 VI 2001, Kim WM; 1♂, Daedong-ri Tanhyeon-myeon Paju-si, 5 V 2006, Yoo IS; 1♀, Wongok-dong Danwon-gu Ansan-si, 12 V 2006, Lee JG. **[GW]** 1♀, Gangchon-ri Namsan-myeon Chuncheon-si, 4 VI 1977, Kim YH; 1♂2♀, Eulmun4-ri Sinbuk-eup Chuncheon-si, 10 V 2001, Kim WM; 7♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 30 VI 2004, Lee JG; 6♂ 18♀, ibid., 25 VI 2005, Lee JG. **[CB]** 1♂, Cheongwon-gun, 24 VI 1992, Lee HJ; 1♂, Bogyeongsa Jungsan-ri Songna-myeon Pohang-si, 22 VI 2001, Hwang JH. **[CN]** 1♂, Guseong2-ri Yeongin-myeon Asan-si, 19 V 2000, Kim HB; 1♂, Seong1-ri Inji-myeon Seosan-si, 19 V 2000, Kim HB; 6♂3♀, Is. Nanjido Seokmun-myeon Dangjin-gun, 6 V 2001, Kim WM; 1♂, Mt. Baekwasan Taean-eup Taean-gun, 2 VI 2001, Kim SY; 2♂, Mt. Gayasan Seosan-si, 27 VI 2002, Kim MA; 1♂, ibid., 27 VI 2002, Sohn JC. **[JB]** 1♂, Byeonsanbando, 2 VI 2001, An SL. **[GB]** 1♂, Mt. Juwangsan, 5 VI 1989, Anonym. **[GN]** 1♂, Mt. Gajisan Ulju-gun Ulsan-si, 28 VI 1989, Bae GH.

27. *Agrilus* (*Quercuagrilus*) *fissus* Obenberger

작은풀색호리비단벌레(신칭)

[Pls. II-j, VI-g]

Agrilus fissus Obenberger, 1917: 214-215 (China). LT ♂ in NMP.

Description. Body length 4.5-7.0 mm; subcylindrical, robust about 3.4-3.5 times as long as wide. Dorsal side feebly lustrous, almost glabrous and concolorous; head, pronotum, elytra and abdominal laterosternites dull green. Ventral side greenish gray. Frons slightly convex; vertex grooved medially with longitudinal lines composed of fine punctures; eyes small. Pronotum transverse about 1.1 times as wide as long, widest at just behind anterior margin; sides strongly acuminated to posterior margin; prehumeral pronotal carinae sharp, strongly curved. Scutellar trnasverse carina well developed. Elytra about 2.8 times as long as wide at humeri; apices acuminated to elytra suture. Abdominal sternite V slightly incurved apically. **[Male]** Prosternal process with dense and long white pubescences. **[Female]** Prosternal process with sparse and short pubescences.

Distribution. Korea **(new record)**, Russia (Far East) and China (Beijing, Heilongjiang, Sichuan, Shaanxi, Shandong & Shanxi).

Host plant. Unknown.

Specimens examined. [GG] 1♀, Baegundae Mt. Bukhansan Seoul-si, 14 VI 1977, Lee HJ; 1♀, Mt. Surisan, 11 VI 1978, Kim MR; 1♀, Mt.

Gwanaksan, 21 V 1989, Yoon SY; 1♂, Yeoncheon-gun, 21 V 1995, Sohn JC; 1♂, Mt. Chungnyeongsan Sudong-myeon Namyangju-si, 24 VI 2000, Sohn JC; 1♀, Seungcheonsa Mt. Myeongjisan Baekdun-ri Buk-myeon Gapyeong-gun, 28 V 2001, Kim TW; 1♂, Jeongneungyuwonji Mt. Bukhansan Jeongneung4-dong Seongbuk-gu Seoul-si, 6 VI 2001, Kim WM; 1♀, Songchu Mt. Bukhansan Uldae-ri Jangheung-myeon Yangju-si, 9 VI 2001, Kim AY; 1♀, Mt. Surisan Gunpo-si, 2 VI 2002, Sohn JC; 1♀, Geumhyeon-ri Soheul-eup Pocheon-si, 11 VI 2006, Lee JG; 1♀, Gwansan-dong Deokyang-gu Goyang-si, 3 VII 2006, Yoo IS. **[CB]** 1♀, Mt. Minjujisan Mulhan-ri Sanchon-myeon Yeongdong-gun, 5 VI 2000, Kim WM. **[CN]** 1♂, Mt. Gyeryongsan Gongju-si, 9 VIII 1992, An SL; 1♀, Donam-ri Banpo-myeon Gongju-si, 21 ~ 28 VI 2005, Anonym, *ex*. Malaise trap. **[JN]** 1♀, Mt. Duryunsan Haenam-gun, 23 VI 1993, Anonym; 1♀, Mt. Jirisan Gurye-gun, 5 VI 1998, Kim SY. **[GB]** 1♀, Hupyeong2-ri Geumsu-myeon Seongju-gun, 9 VI 1992, Anonym; 1♀, Bogyeongsa Jungsan-ri Songna-myeon Buk-gu Pohang-si, 22 VI 2001, Hwang JH. **[GN]** 1♀, Pyeongji-ri Dongbu-myeon Geoje-si, 4 VII 1986, Anonym.

Remarks. This species is newly recorded from Korea.

28. *Agrilus* (*Quercuagrilus*) *friebi* Obenberger

상수리호리비단벌레

[Pls. II-k, VI-h]

Agrilus friebi Obenberger, 1922: 25-26 (Russia). LT ♀ in NMP.

Korean records. ***Agrilus friebi***: Kurosawa, 1963b: 154; Ju, 1969: 114 (N. Korea); Jendek, 1994: 19-20; Kim et al., 1994b: 157; Tôyama, 1985b: 26; Alexeev, 1989: 479-480 (N. Korea); Akiyama and Ohmomo, 2000: 273; Jendek, 2006c: 391 (N. Korea); ***A. friebei*** [sic]: Hua, 2002: 89.

Korean names. 참나무긴구슬벌레(Ju 1969), 상수리호리비단벌레, 상수리비단벌레(Kim et al. 1994b).

Description. Body length about 4.1-5.1 mm; subcylindrical, robust. Dorsal side entirely concolorous, greenish black or blackish blue; elytra with dense and shining white pubescence, except of adsutural posterior third. Ventral side greenish black or blackish blue. Frons almost flat; vertex slightly grooved medially with longitudinal lines composed of fine punctures; eyes small. Pronotum transverse, about 1.4 times as wide as long widest at posterior third; prehumeral carinae short, slightly bent, joined with marginal carinae at posterior third; medial pronotal groove deep and longitudinal with transverse rugose. Scutellar transverse carina well developed. Elytra about 2.6 times as long as wide at humeri; apices rounded apically. Abdominal sternite V strongly incurved apically. **[Male]** Prosternal process covered with dense and long white pubescence. **[Female]** Prosternal process covered with short and sparse white pubescence.

Distribution. Korea, Russia (Far East), China (Anhui, Gansu, Heilongjiang, Jiangsu & Shaanxi) and Japan (Hokkaido, Honshu, Shikoku, Kyushu & Tsushima).

Host plants. *Quercus acutissima* 상수리나무, *Q. crispula*, *Q. serrata* 졸참

나무 and *Rhamnus japonica* (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♀, Gwangneung, 14 V 1974, Lee SH; 1♂, Suwon-si, 17 VI 1983, Im DJ; 1♀, Gwangneung, 29 V 1990, Park DG; 2♂, Uiwang-si, 22 V 2000, Anonym; 1♀, Mt. Bulgisan Gapyeong-gun, 18 VI 2000, Sohn JC; 1♂, Sagimakgol Jungwon-gu Seongnam-si, 1 VI 2001, Lee HA. **[GW]** 1♀, Yeondeok-ri Buk-myeon Yeongwol-gun, 10 VI 1992, Anonym; 1♂1♀, Mt. Duwibong, Jeongseon-gun, 10. VI. 2000, An SL. **[CB]** 1♂, Hakbong-ri Banpo-myeon Gongju-si, 15 VI 1992, Anonym; 1♂, Mt. Daemisan Chungju-si, 19 V 1997, Park HC; 1♂, Hwayanggugok Mt. Songnisan Cheongcheon-myeon Goesan-gun, 26 V 2002, Sohn JC. **[JB]** 1♂, Chiryeonpokpo Mt. Deogyusan Anseong-myeon Muju-gun, 15 V 1999, An SL. **[GN]** 1♂, Cheonggoksa Galjeon-ri Geumsan-myeon Jinyang-gun, 14 V 1986, Anonym.

29. *Agrilus* (*Quercuagrilus*) *marginicollis* E. Saunders stat. nov.

머루호리비단벌레(신칭)

[Pls. II-l, VI-i]

Agrilus marginicollis E. Saunders, 1873: 516 (Japan). LT ♂ in NHM.
See Jendek (2006c) for more synonyms and references.

Description. Body length about 4.4-5.5 mm; Body elongate about 3.7-3.9 times as long as wide. Dorsal side lustrous; head and pronotum dark olivaceous green; elytra olivaceous green with shining white pubescence along the elytral suture. Ventral side dark olivaceous green with a

lustrous. Frons slightly convex; vertex grooved medially with longitudinal lines composed of fine punctures; eyes small. Pronotum about 1.0 times as wide as long, widest at middle; sides almost subparallal; prehumeral pronotal carinae sharp, strongly curved. Scutellar transverse carina well developed. Elytra about 2.6 times as long as wide at humeri; apices acuminated to elytra suture. Abdominal tergites III-V slightly grooved medially; tergite VI and VII with distinct longitudinal median carinae; carina of tergite VII not extending beyond posterior margins; abdominal sternite V slightly incurved apically. **[Male]** Frons pale green, more lustrous; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Prosternal process with dense and long white pubescence. **[Female]** Frons greenish brown, less lustrous; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Prosternal process with sparse and short white pubescence.

Distribution. Korea **(new record)**, Russia (Far East), China (Hubei, Shaanxi & Zhejiang) and Japan (Hokkaido, Honshu, Shikoku & Kyushu).

Host plant. *Vitis coignetiae* 머루 (Akiyama & Ohmomo 1997).

Specimens examined. [CB] 1♀, Miwon-ri Miwon-myeon Cheongwon-gun, 24 VI ~ 1 VII 2005, Anonym, *ex*. Malaise trap. **[CN]** 1♂1♀, Donam-ri Banpo-myeon Gongju-si, 28 VI ~ 5 VII 2005, Anonym, *ex*. Malaise trap. **[GB]** 1♂1♀, Naribunji Is. Ulreungdo, 15 VII 1995, An SL; 1♀, Namsa-ri Hyeongok-myeon Gyeongju-si, 30 VI ~ 14 VII 2005, Anonym, *ex*. Malaise trap.

Remarks. This species is newly recorded from Korea.

30. *Agrilus* (*Quercuagrilus*) *ribbei* Kiesenwetter

풀색호리비단벌레

[Pls. III-a, VI-j]

Agrilus ribbei Kiesenwetter, 1879: 255 (Russia).

Agrilus lewisiellus Kerremans, 1903: 287.

Agrilus tibialis corax Obenberger, 1917: 39 (Russia).

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus lewisiellus***: Cho, 1967: 194; Kim et al., 1994b: 157; An, 2004: 42; ***A. tibialis***: Kim et al., 1974: 221; Kurosawa, 1976: 133; Tôyama, 1985b: 29; Alexeev, 1989: 480 (N. Korea); Tôyama, 1989: 324; Kim et al., 1994b: 157; Akiyama and Ohmomo, 1997: 41; Hua, 2002: 90; ***A. tibialis corax***: Jendek, 1994: 17-18; Akiyama and Ohmomo, 2000: 278.

Korean names. 가는다리긴비단벌레(Cho 1967), 가는다리긴구슬벌레(Ju 1969), 풀색비단벌레(Kim et al. 1974), 갈참나무비단벌레, 풀색호리비단벌레(Kim et al. 1994b).

Description. Body length about 4.5-8.0 mm; elongate, subcylindrical. Dorsal side entirely concolorous, dark greenish olivaceous or greenish gray. Ventral side lustrous, greenish gray. Frons slightly convex; vertex indistinctly grooved medially with longitudinal lines composed of small punctures; eyes medium. Pronotum transverse, about 1.5 times as wide as long, and widest at anterior margin; sides subparallal, slightly acuminated

to the posterior angles; prehumeral carinae short, slightly bent; medial pronotal groove shallow without transverse elevation. Scutellar transverse carina well developed. Elytra about 2.8 times as long as wide at humeri, almost parallel, slightly acuminate in a posterior third; apices rounded, feebly and indistinctly serrate. Abdominal sternite V strongly incurved apically.

Distribution. Korea, Russia (East Siberia & Far East), China (Hebei, Heilongjiang, Hubei, Jilin, Liaoning, Sichuan, Shaanxi & Shanxi) and Japan (Hokkaido, Honshu, Shikoku, Kyushu & Tsushima).

Host plants. *Carpinus* spp. and *Quercus* spp. (Akiyama & Ohmomo 1997).

Specimens examined. [CN] 1ex., Baekripo Sowon-myeon Taean-gun, 11 VI 2005, Lee JG. **[GW]** 1ex., Eulmun4-ri Sinbuk-eup Chuncheon-si, 10 V 2001, Kim WM; 1ex., Mt. Odaesan, 24 V 2002, Lee HS.

31. *Agrilus* (*Quercuagrilus*) *ussuricola* Obenberger

우수리호리비단벌레

[Pls. III-b, VI-k]

Agrilus ussuricola Obenberger, 1924: 46 (Russia). LT ♂ in NMP.

Agrilus ussuricola lasiolus Obenbeger, 1935: 170. [syn. by Jendek 2005: 21-22]

Korean records. ***Agrilus lasiolus***: Kurosawa, 1963b: 154; Kim et al., 1994b: 157; Akiyama and Ohmomo, 1997: 35; Akiyama and Ohmomo, 2000: 274; Kim, 2002b: 282; ***A. ussuricola***: Alexeev, 1989: 479 (N. Korea);

Kim et al., 1994b: 157; Jendek, 2005: 21-22 (N. Korea); Jendek, 2006c: 392.

Korean names. 애검정호리비단벌레, 우수리호리비단벌레(Kim et al. 1994b).

Description. Body length about 3.9-4.0 mm; subcylindrical, robust about 3.5 times as long as wide. Dorsal side lustrous; entirely greenish brown. Ventral side lustrous, dark greenish brown. Head slightly narrower than the base of pronotum; frons slightly convex; vertex with longitudinal lines composed of small punctures; eyes medium; antennae serrate from the fourth segment. Pronotum transverse, about 1.4 times as wide as long, and widest at posterior third; sides subparallal, slightly acuminated to the posterior angles; median pronotal groove shallow without transverse elevation. Scutellar transverse carina well developed. Elytra about 3.4 times as long as wide; apices rounded, feebly and indistinctly serrate. Abdominal sternite V strongly incurved apically.

Distribution. Korea, Russia (Far East), China (Heilongjiang & Shaanxi) and Japan (Tsushima).

Host plants. *Quercus* spp. (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♂, Gwangneung-si, 29 V 1983, Lee YI; 1♂, Suwon-si, 11 VI 1983, IM DJ; 1♂1♀, Mt. Yumyeongsan Okcheon-myeon Yangpyeong-gun, 14 VI 1997, Choi JY.

32. *Agrilus* (*Quercuagrilus*) *varius* Kerremans stat. nov.

맵시호리비단벌레(신칭)

[Pl. III-c]

Agrilus varius Kerremans, 1895: 221-222 (China). LT ♀ in MNHN.

Description. Body length about 4.4-5.6 mm; elongate about 3.6 times as long as wide. Dorsal side lustrous; entirely olivaceous green; elytra with white tomentose spots in adsutural posterior third. Ventral side lustrous, olivaceous green. Frons slightly convex; vertex slightly grooved medially with longitudinal rugose; eyes small. Pronotum square-shape, about 1.3 times as wide as long, widest at middle; sides margins subparallel; prehumeral carinae well developed, strongly curved at middle, reaching to anterior margin of pronotum. Scutellar transverse carina well developed. Elytra about 2.9 times as long as wide at humeri, slightly acuminate in posterior third; apices incurved each side. Abdominal sternite V silghtly incurved apically.

Distribution. Korea **(new record)** and China (Shaanxi, Shandong).

Host plant. Unknown.

Specimens examined. [GW] 1♀, Biseondae Mt. Seoraksan Sokcho-si, 30 VIII ~ 15 IX 2002, Park SJ and Park JS, *ex*. FIT; 2♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 5 VII 2003, Lee JG. **[CN]** 1♀, Sutonggol Daejon-si, 4 VII 1999, Kim HJ, *ex*. mushroom. **[GN]** 1♀, Yonggang-ri Hwagae-myeon Hadong-gun, 29 ~ 30 VII 1990, Ku DS.

Remarks. Only female specimens were examined in this study. So, further studies and male specimens are needed. This species is newly recorded from Korea.

Subgenus *Robertius* Théry, 1947

반짝호리비단벌레아속(신칭)

Agrilus (*Robertius*) Théry, 1947: 670.

Type species: *Agrilus robertii* Chevrolat, 1838 [= *Agrilus pratensis* (Ratzeburg, 1837)].

Agrilus (*Arquagrilus*) Alexeev, 1998: 369. [syn. by Jendek 2006a: 35]

Type species: *Buprestis pratensis* Ratzeburg, 1837

Diagnosis. Body length 3.5-11.0 mm. Eyes protruding, or not, beyond general head contour. Frons flattened, commonly with distinct longitudinal median impression, very rarely with transverse impression or lateral ones in posterior half. Vertex with punctate striae forming concentric pattern. Antero- and posteromedian pronotal impressions generally well pronounced, separated by transverse elevation, rarely nearly indistinct; marginal pronotal carinae converging posteriad; submarginal carinae not reaching to posterior margin of pronotum. Last abodominal tergite usually with longitudinal median carina, sometimes nearly invisible, or, very rarely, without any. **[Male]** Aedeagus sclerotized part of paramere apex and, usually, tegminal tubes covered with very short, reclinate spiniform setae. Penis with robust, strongly sclerotized apodeme; large oval chamber, surrounding terminal part of ejaculatory duct, bears median longitudinal slit of varing width and with sides commonly bi-, rarely trisinuate or nearly parallel; in posterior 2/3 sclerotized cords run

sideways and backwards from lateral margins of the chamber and bear mostly triangular scales arranged in two trains.

Distribution. Palaearctic (European, Siberian, Mediterranean & Manchurian subregions), Afrotropical and Nearctic regions.

Key to the species of the subgenus *Robertius* in Korea

1. Scutellum without transverse carinae ····· ***subauratus amurensis***
– Scutellum with transverse carinae ····· **2**
2. Elytra with a pair of white tomentose spots ····· **3**
– Elytra entirely glabrous without tomentose spots ····· **3**
3. Body length 4.0-8.1 mm; light-bronze or bronze ····· ***pekinensis***
– Body length 5.3-7.8 mm; olive green or greenish brown ··· ***peregrinus***
4. Elytral apices truncated apically ····· **5**
– Elytral apices rounded apically ····· 7
5. Prehumeral carinae almost feeble or indistinct ····· ***moerens***
– Prehumeral carinae distinct ····· **6**
6. Middle sized (6.1-8.1 mm); prehumeral carinae elevated along entire length ····· ***sibiricus***
– Small sized (4.1-4.6 mm); prehumeral carinae short not elevated along entire length ····· ***soudeki***
7. Pronotal anteromedial depression feeble or absent ····· ***delphinensis***
– Pronotal anteriomedial depression well pronounced ····· **8**
8. Middle sized (7.6-8.0 mm); Pronotum widest at anterior angles

..... ***smaragdinus***

– Small to middle sized (4.5-7.8); Pronotum not widest at anterior angles **9**

9. Pronotum widest at middle ..... ***komareki***

– Pronotum widest at anterior third **10**

10. Prehumeral carinae sharp and strongly elevated along entire length ..... ***nicolanus***

– Prehumreal carinae obtuse or only indicated in pronotal structure ..... ***pseudocyaneus***

33. *Agrilus* (*Robertius*) *delphinensis* Abeille de Perrin
작은군청색호리비단벌레(신칭)

Agrilus delphinensis Abeille de Perrin, 1897: 12-13 (France). LT ♂ in MNHN.

See Jendek (2006c) for more synonymy and references.

Korean record. ***Agrilus delphinensis***: Jendek, 2006c: 393 (N. Korea).

Description. "The head and pronotum are without surface micro-sculpture, shiny. The small prehumeral pronotal carinae (in the posterior corners of pronotum) are sharp, short; their length is up to a quarter of the length of pronotum. In the middle of posterior part of pronotum lies a shallow, barely discernable depression. The anterior edge of prosternal lobe is widely but shallowly emarginate in the middle; it is nearly straight. The

prosternal process has parallel edges; tapers from the middle backward in V-shape and sparse whitish hairs cover its surface. The elytra display short, whitish scattered hairs, which can only be observed under strong magnification. Uni-coloured; light blue, dark blue or occasionally violet species of small stature. Length: 4.0-5.5 mm." (Muskovits & Hegyessy 2002).

Distribution. Korea (North) and Russia (East Siberia, Far East & West Siberia), Mongolia, China (Heilongjiang & Northern Territory) and Europe.

Host plants. *Salix caprea* 호랑버들 and *S. viminalis* 육지꽃버들 (Jendek 1995b).

Remarks. This species was reported for the first time in North Korea by Jendek (2006c) without particular records. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Muskovits and Hegyessy (2002). This species resembles to *Agrilus* (*Robertius*) *pseudocyaneus*, but diagnostic characters as shown in Table 6.

Table 6. Comparison of diagnostic characters between *Agrilus* (*Robertius*) *delphinensis* and *A.* (*R.*) *pseudocyaneus*

species / characters	*A.* (*R.*) *delphinensis*	*A.* (*R.*) *pseudocyaneus*
body length (mm)	4.3 - 5.3	4.5 - 7.8
body shape	slender	robust
mentoniere	narrow, slightly emarginate medially	large, deeply emarginate medially
pronotal anteromedial depression	feeble or absent	distinct

34. *Agrilus* (*Robertius*) *komareki* Obenberger

구리빛반짝호리비단벌레(신칭)

[Pls. III-d, VI-l]

Agrilus komareki Obenberger, 1926: 102-103 (Japan). LT ♀ in NMP.

Agrilus ronino Obenberger, 1935: 167 (Japan). [syn. by Jendek 1994: 19]

Korean records. ***Agrilus ronino***: Kim and Kim, 1971: 157; Kim et al., 1994b: 157; Park, 1998: 46; Kim and Kim, 1998: 171; An, 2000: 45.

Korean name. 날개잘린호리비단벌레(Kim et al. 1994b).

Description. Body length 4.0-6.2 mm; subcylindrical, elongate. Dorsal side lustrous, glabrous; head, pronotum, elytra and abdominal laterosternites dull brown or dark grayish green with short white pubescence sometimes visible only along sutural margin. Frons convex; vertex slightly grooved medially with longitudinal line composed of fine punctures. Pronotum wide about 1.3 times as wide as long, widest at middle; medial pronotal depression shallow but conspicuous and centrally narrowed or disrupted, prehumeral carinae sharp, long and laterally curved. Elytra about 3.0 time as long as wide at humeri; apices broadly rounded separately. Abdominal sternite V rounded apically.

Distribution. Korea (South) and Japan (Hokkaido, Honshu, Shikoku & Kyushu).

Host plants. *Morus bombycis* 산뽕나무, *Symplocos prunifolia* 검은재나무

and *Ulmus davidiana* var. *japonica* 느릅나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1ex., Suwon-si, 10 VI 1987, Anonym; 1ex., Seodun-dong, Gwonseon-gu Suwon-si, 21 V 1990, Anonym; 1ex., Mt. Cheonggyesan, 11 VI 1999, Anonym; 2exs., Seodun-dong Gwonseon-gu Suwon-si, 9 V 2003, Park HC. **[GW]** 1ex., Mt. Seoraksan, 7 VIII 1958, Anonym; 1ex., Naegok-dong Gangneung-si, 20 V 2002, Lee YB. **[CB]** 1ex., Hwayanggugok Mt. Songnisan Cheongcheon-myeon Goesan-gun, 26 V 2002, Sohn JC; 1ex., Gyesin-dong Heungdeok-gu Chungju-si, 31 V 2004, Park HC et al. **[JB]** 1ex., Mt. Sinjangsan Neungdong-ri Iksan-si, 15 V 2001, Lee HS. **[GB]** 1ex., Mt. Naeyeonsan, 11 V 2002, An SL.

35. *Agrilus* (*Robertius*) *moerens* E. Saunders

연노랑비단벌레

[Pls. III-e, VII-a]

Agrilis moerens E. Saunders, 1873: 517 (Japan). LT ♀ in NHM.

Agrilus mandjuricus vladivostokanus Obenberger, 1922: 23-24 (Russia). [syn. by Jendek 1994: 15-16]

Agrilus vladivosokanus: Obenberger, 1924: 46-47, fig 53.

Agrilus rotundicollis E. Saunders, 1873: 517-518 (Japan). [syn. by Jendek 1995: 138]

Korean records. ***Agrilus rotundicollis***: Kurosawa, 1963b: 154; Ju, 1969: 114; Tôyama, 1985b: 30; Tôyama, 1989: 323; Jendek, 1994: 15-16; Kim et

al., 1994b: 157; Kim, 1995b: 140; Kim and Kim, 1998: 171; An, 2000: 42; Kim, 2000: 133; Kim et al., 2002: 120; Hua, 2002: 90; ***A. vladivostokanus***: Alexeev, 1989: 487 (N. Korea); Kim et al., 1994b: 157; ***A. rotundiollis*** [sic]: An, 1995: 52; ***A. moerens***: Akiyama and Ohmomo, 1997: 35-36; Akiyama and Ohmomo, 2000: 274; Jendek, 2006c: 393.

Korean names. 벚나무긴구슬벌레(Ju 1969), 브라디보스톡호리비단벌레, 연노랑비단벌레(Kim et al. 1994b).

Description. Body length 4.0-7.0 mm; subcylindrical, elongate. Dorsal side lustrous; head and pronotum greenish blue; elytra blue green. Ventral side lustrous, blackish blue. Frons almost flat; vertex slightly grooved medially with longitudinal lines composed of fine punctures; eyes small. Pronotum about 1.3 times as wide as long, widest at middle; sides almost subparallal; prehumeral carinae short, feeble or indistinct. Scutellar transverse carina well developed. Elytra about 2.8 times as long as wide at humeri; apices nearly truncated apically. Abdominal sternite V rounded apically.

Distribution. Korea, Russia (Far East), China (Beijing, Gansu, Heilongjiang, Sichuan & Shaanxi) and Japan (Hokkaido, Honshu, Shikoku, Kyushu & Tsushima).

Host plants. *Quercus acutissima* 상수리나무 and *Q. serrata* 졸참나무 (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♂, Mt. Surisan Gunpo-si, 5 V 2003, Sohn JC. **[CN]** 2♂, Is. Nanjido Seokmun-myeon Dangjin-gun, 6 V 2001, Kim WM; 1♀, Mt. Minjujisan, 19 VIII 2001, An SL; 1♀, Is. Anmyeondo Taean-gun, 8 V 2003, An SL; 1♀, Is. Anmyeondo Taean-gun, 23 V

2004, An SL. **[GB]** 2♂1♀, Mt. Naeyeonsan, 12 V 2002, An SL.

36. *Agrilus* (*Robertius*) *nicolanus* Obenberger
청동호리비단벌레(신칭)

Agrilus foveivollis nicolanus Obenberger, 1924: 42 (Russia). LT ♂ in NMP.

Korean records. *Agrilus nicolanus*: Akiyama and Ohmomo, 1997: 36; Akiyama and Ohmomo, 2000: 274; Jendek, 2006c: 393. [stat. by Jendek, 1994]

Description. "3.8-5.5 mm long. Entire body bronze to dark green with silky-lusre, rarely slightly bicolorous, head and pronotum golden-bronze, elytra golden-green. Frons and vertex distinctly convex, vertex broad, 2.5-3.0 times as wide as width of eye (dorsal aspect), with longitudinal, dense grooves, composed of poorly marked punctures. Eyes slightly projecting beyond outline of head. Pronotum transverse depressions deep. Medial pronotal depression disintegrate in two independent parts, basal part conspicuous, apical part sometimes strongly reduced. Pronotum widest in anterior third, with lateral sides nearly lineal before basal angles. Pronotal keels S-shaped, strongly elevated, sharp and bright along entire length." (Jendek 1994).

Distribution. Korea, Russia (Far East, West Siberia) and Japan (Honshu, Shikoku & Kyushu).

Host plants. *Quercus acutissima* 상수리나무 and *Ulmus davidiana* var.

japonica 느릅나무 (Akiyama & Ohmomo 1997).

Remarks. I could not find Korean specimens of this species in this study. So, further studies and Korean specimens are needed. Description followed Jendek (1994).

37. *Agrilus* (*Robertius*) *pekinensis* Obenberger
북경호리비단벌레

Agrilus pekinensis Obenberger, 1924: 55 (China). LT ♀ in NMP.

Korean records. *Agrilus pekinensis*: Alexeev, 1989: 479 (N. Korea); Kim et al., 1994b: 157; Jendek, 1995: 141-142; Jendek, 2006c: 393 (N. Korea).

Korean name. 북경호리비단벌레(Kim et al. 1994b).

Description. Body length about 4.0-8.1 mm; entirely light-bronze, bronze; elytra with triangular spots on the sides (Alexeev 1998).

Distribution. Korea (North), Russia (East Siberia & Far East), Mongolia, China (Beijing, Fujian, Heilongjiang, Nei Mongol, Shaanxi, Xinjiang & Zhejiang) and Kazakhstan.

Host plant. Unknown.

Remarks. I could not find Korean specimens of this species in this study. So, further studies and Korean specimens are needed. Description followed Alexeev (1998).

38. *Agrilus* (*Robertius*) *peregrinus* Kiesenwetter

외제호리비단벌레

[Pls. III-f, VII-b]

Agrilus peregrinus Kiesenwetter, 1879: 145 (Russia). LT ♀ in ZSM.

Korean records. ***Agrilus peregrinus***: Alexeev, 1989: 485 (N. Korea); Kim et al., 1994b: 157; Jendek, 2006c: 393 (N. Korea).

Korean name. 외제호리비단벌레(Kim et al., 1994b).

Description. Body length about 5.3-7.8 mm; subcylindrical, elongate. Dorsal side lustrous, entirely olive green or greenish brown; elytra with white tomentose spot in adsutural apical third. Ventral side olive green with a lustrous. Frons slightly convex; vertex feebly grooved medially with concentric rogose; eyes small. Pronotum wide, about 1.9 times as wide as long widest at middle; sides regularly curved with small and deep lateral depressions; medial pronotal groove divided into a shallow transverse anterior depression and an elongate posterior depression; prehumeral carina short, slightly bent and usually obtuse. Scutellar transverse carina well developed. Elytra about 3.1 times as long as wide at humeri, widest at posterior third; apices rounded, feebly and indistinctly serrate. Abdominal strenite V rounded apically.

Distribution. Korea, Russia (Far East) and China (Hebei & Nei Mongol).

Host plant. Unknown.

Specimens examined. [GG] 1ex., Sagimakgol Jungwon-gu Seongnam-si, 1 VI 2001, Lee HA; 1ex., Mt. Cheonggyesan Seoul-si, 23 V 2004, Ban

JE. **[GW]** 1ex., Guryongnyeong Seo-myeon Yangyang-gun, 17 VI 2001, Oh HY; 1ex., Mt. Sukbyeongsan Okgye-myeon Gangneung-si, 19 V 2002, Yun SH. **[GB]** 1ex., Yeongnam Univ. Gyeongsan-si, 14 V 1991, Kang GH; 1ex., Yeongnam Univ. Gyeongsan-si, 16 V 1991, Kwon OS; 1ex., Yeongnam Univ. Gyeongsan-si, 18 V 1991, Kang GH; 1ex., Yeongnam Univ. Gyeongsan-si, 1 V 1992, Ok WS; 1ex., Mt. Bibongsan, 7 V 1999, An SL. **[GN]** 1ex., Dunma-ri Namha-myeon Geochang-gun, 23 V 1989, Kwon YB.

39. *Agrilus* (*Robertius*) *pseudocyaneus* Kiesenwetter

군청색호리비단벌레

[Pls. III-g, VII-c]

Agrilus pesudocyaneus Kiesenwetter, 1857: 150-151 (Austria). LT (sex not examined) in MNHU.

See Jendek (2006c) for more synonymy and references.

Korean records. *Agrilus pesudocyaneus*: Alexeev, 1989: 487 (N. Korea); Kim et al., 1994b: 157.

Korean name. 군청색호리비단벌레(Kim et al. 1994b).

Description. Body length 4.5-4.9 mm; subcylindrical, robust about 3.3 times as long as wide. Dorsal side lustrous; blue green, sometimes slightly bicolorous. Frons slightly convex; vertex feebly grooved medially with concentric rogose; eyes small. Pronotum transverse, about 1.6 times as wide as long, widest at anterior third; prehumeral carinae knoll-like,

obtuse or only indicated in pronotal structure; prosternal process subparallel or slightly widened between coxae, without laterally projecting angles. Elytra about 2.6 times as long as wide; apices separately evenly rounded.

Distribution. Korea, Russia (East Siberia & West Siberia) and Europe.

Host plant. *Populus tremula* (Bílý 2002).

Specimens examined. [GG] 1♂, Gil-dong Gangdong-gu, ? VI 2004, Jung BH. **[GW]** 1♂, Witsaembat Chuncheon-si, 24 V 2001, Sohn JC. **[GB]** 1♀, Naewondong Mt. Juwangsan Budong-myeon Cheongsong-gun, 5 VI 1989, Kim G.

40. *Agrilus* (*Robertius*) *sibiricus* Obenberger
단풍나무호리비단벌레(개칭)

Agrilus sibiricus Obenberger, 1912: 70, fig. 5 (Russia). HT ♂ in NMP.

Agrilus insuspectus Obenberger, 1924: 43, fig. 46 (Russia). [syn. by Jendek, 1994: 11-12]

Korean records. ***Agrilus insuspectus***: Tôyama, 1985b: 30; Tôyama, 1989: 323; Kim and Park, 1991b: 193; Kim et al., 1991a: 170; Kim et al., 1994b: 157; ***A. sibiricus***: Alexeev, 1989: 484-485 (N. Korea); Kim et al., 1994b: 157; Akiyama and Ohmomo 1997: 38-39; Akiyama and Ohmomo 2000: 276; Jendek, 2006c: 394.

Korean names. 시베리아호리비단벌레, 애검녹색호리비단벌레(Kim et al., 1994b).

Description. Body length 6.1-8.1 mm. Dorsal side bluish-green, brownish green or golden-brown, silky lustre, sometimes bicolorous. Frons flattended, vertex convex, both with obvious medial groove. Pronotum transverse, rather convex in transverse direction, with rounded, rarely with feebly angulated lateral sides. Pronotal keels S-shaped or almost straight, sharp and elevated along entire length. Elytral apices trucated, with lateral sides subparallel or obviously dilated (Jendek 1994).

Distribution. Korea, Russia (Far East) and China (Heilongjiang & Nei Mongol).

Host plants. *Acer* spp. (Akiyama & Ohmomo 1997).

Remarks. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Jendek (1994).

41. *Agrilus* (*Robertius*) *smaragdinus* Solsky

청단호리비단벌레

[Pls. III-h, VII-d]

Agrilus smaragdinus Solsky, 1876: 279 (Russia).

Korean records. ***Agrilus smaragdinus***: Alexeev, 1989: 485 (N. Korea); Kim et al., 1994b: 157.

Korean name. 청단호리비단벌레(Kim et al. 1994b).

Description. Body length about 7.6-8.0 mm; subcylindrical, elongate; entirely concolorous, emerald green with a lustrous. Frons slightly

convex; vertex indistinctly grooved medially with longitudinal lines composed of fine punctures; eyes medium. Pronotum transverse, about 1.4 times as wide as long, widest just behind the anterior margin, attenuate posteriorly; medial pronotal groove well developed, deep and longitudinal; prehumeral carinae almost obsolete. Scutellar transverse carina well developed. Elytra about 3.0 times as long as wide at humeri; apices rounded apically. **[Male]** Frontal lateral margins more narrowed anteriad. Prosternal process with dense and long white pubescence. Abdominal sternite V widely rounded apically, occasionally obtuse or somewhat excised in the middle, rarely roundly trapezoidal. **[Female]** Frontal lateral margins less narrowed anteriad. Prosternal process with sparse and short pubescence. Abdominal sternite roundly triangular, with narrowly or widely rounded apex.

Distribution. Korea, Russia (Far East) and China (Northeast).

Host plant. Unknown.

Specimens examined. [GG] 1ex., Mt. Suraksan Nowon-gu Seoul-si, 9 V 1998, Park GN. **[GW]** 1ex., Gachilbong Yanggu-gun, 31 V 1992, Lee JW; 1ex., Sambong Gwangwon-ri Nae-myeon Hongcheon-gun, 10 VI 1995, Cho YS; 1ex., Dangungak Mt. Taebaeksan Taebaek-si, 30 V 1999, Kim YS; 1ex., Bukdaesa Mt. Odaesan, 28 V 1998, Park SW; 1ex., Guryongnyeong Seo-myeon Yangyang-gun, 24. VI. 2001, Oh HY; 1ex., Mt. Hambaeksan Taebaek-si, 6 VI 2005, Kim TW. **[CN]** 1ex., Mt. Seodaesan Chubu-myeon Geumsan-gun, 24 V 2002, Lee SD. **[GB]** 1ex., Huibangsa Mt. Sobaeksan Punggi-eup Yeongju-si, 8 V 1974, Park JH; 1ex., Donghwasa Dohak-dong Dong-gu Daegu-si, 24 V 1986, Nam JS;

1ex., Yeongnam Univ. Gyeongsan-si, 17 V 1990, Jeong MG; 1ex., Yeongnam Univ. Gyeongsan-si, 22 VI 1992, Kim YM. **[GN]** 1ex., Ojeon-ri Murya-myeon Bonghwa-gun, 20 V 1998, Kim JI; 1ex., Mt. Jirisan, 13 VII 2001, An SL.

42. *Agrilus* (*Robertius*) *soudeki* Obenberger

수덱호리비단벌레

[Pls. III-i, VII-e]

Agrilus soudeki Obenberger, 1926: 103 (Russia). LT ♂ in NMP.

Korean records. ***Agrilus soudeki***: Alexeev, 1989: 484 (N. Korea); Jendek, 1994: 20 (N. Korea); Kim et al., 1994b: 157; Jendek, 2006c: 394 (N. Korea).

Korean name. 수덱호리비단벌레(Kim et al. 1994b).

Description. Body length about 4.1-4.6 mm; subcylindrical and robust, about 3.3 times as long as wide in male. Dorsal side strongly lustrous, glabrous; entirely concolorous; head, pronotum and elytra greenish brown or yellowish green. Ventral side strongly lustrous; greenish brown or yellowish green, entirely covered with faint whitish pubescence. Frons nearly flat, vertex distinctly convex, eyes small, not extending beyond the outline of frons, pronotum and head with obvious dominant microsculpture covering basal pronotal depressions present and rather deep, elytra without distinct pubescence, elytral apices truncate and finely serrate.

Distribution. Korea, Russia (Far East) and China (Heilongjiang & Shanxi).

Host plant. Unknown.

Specimens examined. [GG] 1♂1♀, Suwon-si, 9 III 1990, Anonym. **[GW]** 1♂, Changwon2-ri Nam-myeon Yeongwol-gun, 20 V 2003, Sohn JC.

43. *Agrilus subauratus amurensis* Obenberger

남색호리비단벌레

[Pls. III-j, VII-f]

Agrilus amurensis Obenberger, 1922: 21-22 (Russia). LT (sex not examined) in NMP.

Korean records. ***Agrilus suvorovi*** [misid.]: Kim, 1981: 343; ***A. subauratus amurensis***: Alexeev, 1989: 483 (N. Korea); Jendek, 1995: 146; Jendek, 2006c: 394 (N. Korea); ***A. subauratus*** [misid.]: Kim et al., 1994b: 157.

Korean name. 남색호리비단벌레(Kim et al. 1994b).

Description. Body length 6.5-8.5 mm; subcylindrical, robust about 2.9 times as long as wide. Dorsal side lustrous; head and pronotum blue or bluish green; elytra bluish green. Ventral side more lustrous, the same colored as dorsum. Head distinctly narrower than the base of pronotum; frons slightly grooved medially; vertex slightly grooved medially with concentric lines of small punctures; eyes small. Pronotum transverse, about 1.5 times as wide as long, widest at the posterior third; sides somewhat lobate at middle, slightly incurved before posterior angles; prehumeralcarinae indistinct or not developed at all; prosternal process

subparallel, pointed apically. Scutellum without a transverse carina. Elytra 2.9 times as long as wide at base, widening at posterior third, simply rounded and very slightly serrate apically. Abdominal sternite V slightly incurved. **[Male]** Prosternal pubescence dense and long. **[Female]** Prosternal pubescence sparse and short, almost indistinct.

Distribution. Korea, Russia (East Siberia & Far East), Mongolia, China (Heibei & Jilin) and Japan (Hokkaido).

Host plants. *Populus tremula*, *Salix aurita*, *S. capraea*, *S. incana*, *S. nigricans* and *S. purpurea* (Bílý 2002).

Specimens examined. [GG] 1♀, Mt. Myeongjisan Gapyeong-gun, 28 V 1978, Kim HB; 1♂1♀, Naebang-ri Sudong-myeon Namyangju-si, 28 V 1980, Kim JI; 1♂, ibid., 31 V 1980, Park HG; 2♀, Wontongsa Sineup-ri Pocheon-gun, 8 VII 2006, Lee JG. **[GW]** 1♀, Sachang-ri Sanae-myeon Hwacheon-gun, 28 V 1992, Lee YM and Kweon CI. **[CB]** 1♀, Mt. Gyeryongsan Gongju-si, 12 VI 1998, Kim MH. **[CN]** 1♀, Mt. Woraksan Jecheon-si, 28 V 1985, Kim CM.

Remarks. *Agrilus subauratus amurensis* differs from the nominotypical subspecies by lacking the bicoloration.

Subgenus *Sinagrilus* Alexeev
고려호리비단벌레아속(신칭)

Agrilus (*Sinagrilus*) Alexeev, 1998: 379.

Type species: *Agrilus sinensis* J. Thomson, 1879.

Diagnosis. Body length 6.8-13.6 mm. Eyes protruding beyond head contour. Frons slightly narrowed anteriad, with S-shaped lateral margins between eyes. Vertex anteriorly with very wide and deep median impression narrowed to base and with concentric pattern of punctate striae. Pronotum with transverse, occsionally rather shallow anterior impression and deeper, foveiform posterior one; carinae at posterior corners merged with those at anterior corners, forming common carina occasionally interrupted in middle 1/3; marginal submarginal carinae converging to posterior 2/5; submarginal ones not reaching to posterior margin of pronotum. Posterior prosternal process with a brush of white, or yellowish, shining setiform scales sometimes covering collar and middle part of both metasternum and first visible abdominal sternite. Last abdominal tergite with median longitudinal carina. **[Male]** Apex of last abdominal sternite narrowly truncate in the middle. Aedeagus very strongly sclerotized, tegmen linearly widened anteriad in basal half, then more narrowed apicad; parameres very strongly narrowed to acute apices, with soft swollen regions lying along entire outer margin and covered with very dense long setae; inner surface of sclerotized regions of parameres and that of terminal part of tegminal tube with very fine, spiniform setae reclinate posteriad and passing onto outer surface. Penis narrow, strongly sclerotized, with nearly straight lateral margins, truncate apex, and roundly triangular excision at tip; large and nearly parallel-sided apodeme bears on posterior margin narrow, widened, posteriorly pointed median process with reflexed margins forming groove for terminal part of ejaculatory duct surrounded terminally, together with

the groove, by basal ring-shaped structure. Median process laterally with two sclerotized cords diverging posteriad, running from posterior margin of apodeme, and bearing diagonal cords laterally and abundant longitudinal fine cords apically; the later extend posteriad beyond apex of median process.

Distribution. Palaearctic (Manchurian subregion) and Oriental regions.

44. *Agrilus* (*Sinagrilus*) *coreanus* Obenberger
고려호리비단벌레

Agrilus coreanus Obenberger, 1935: 162-163 (Korea). LT ♂ in NMP.

Korean records. ***Agrilus coreanus***: Obenberger, 1935: 162-163 (Jemulpo, Incheon-si); Miwa and Chûjô, 1936: 15; Obenberger, 1936: 978; Cho, 1957: 47; ZSK, 1968: 109; Kim et al., 1994b: 156; Jendek, 1995a: 145 (S. Korea), Kim, 2002b: 282; Jendek, 2006c: 394 (S. Korea).

Korean names. 고려호리비단벌레(Kim et al. 1994b).

Description. "11.0 mm long, closely related to *A. sinensis* from which it differs mainly by shallower medial groove on vertex, anteromedial pronotal lobe prominent, nearly angular on top, pronotal disc with finer and longer transverse wrinkles and by aedeagus completely different." (Jendek 1995a).

Distribution. So far known only from type locality.

Remarks. This species was newly recorded in South Korea by Obenberger (1935). But the other records were just quotation from the record except

for Jendek (1995a). I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description followed Jendek (1995a). This species is Korean endemic.

Subgenus *Sinuatiagrilus* Alexeev
사과호리비단벌레아속(신칭)

Agrilus (*Sinuatiagrilus*) Alexeev, 1998: 372.

Type species: *Buprestis sinuata* A. G. Olivier, 1790.

Diagnosis. Body length 7.0-13.0 mm. Body bronze or brassy-bronze, dosally with puple tint. Frons and pronotum noticeably flattened longitudinally, with coarse punctate-striate sculpture against the shagreened and dully shining background. Lateral margins of frons S-shaped narrowed anteriad. Anterior margin of mentum with triangular excision in the middle. Vertex commonly with straight punctate striae occasionally arcuate, extremely rarely strongly curved, forming concentric pattern. Pronotum with deep, wide lateral impressions and gentle anterior and posterior median impressions separated by transverse elevation. Marginal and submarginal pronotal carinae very close in posterior 1/4 of pronotum, farther occasionally party merged; carinae at posterior pronotal corners developed, strongly convex, and S-shaped or arcuately curved, more strongly at base. Elytra quite glabrous or with 2-6 feeble spots of fine, rather short, shining setiform scales in humeral depressions and sutural impressions. Median carina of last abdominal tergite narrowing and

disappearing apicad; last sternite longitudinally concave. **[Male]** Aedeagus wide; widened. occasionally very strongly, apicad. Penis wide, oval with galeate apodeme; in apical 1/2-2/3 with complex structures surrounding ejaculatory duct and occupying entire space between the duct and lateral edges of penis; the structures consist of narrow median capsule anteriorly surrounded by bend of sclerotized, transversely arcuate, fine cords, and laterally bearing diagonal cords turning posteriorly into diagonal-longitudinal cords with short transverse rod-shaped process.

Distribution. Palaearctic (European, Siberian, Mediterranean & Manchurian subregions) and Nearctic (introduced) regions.

45. *Agrilus* (*Sinuatiagrilus*) *mali* Muramatsu

사과호리비단벌레

[Pls. III-k, VII-g]

Agrilus mali Muramatsu, 1924: 1-21, figs. 1-4 (Korea).

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus mali***: Muramatsu, 1924: 1-21; Yuasa, 1933: 263-282; Miwa and Chûjô, 1936: 18; Obenberger, 1936: 1012; Nakayama and Okamoto, 1940: 204-205; Cho, 1957: 47; ZSK, 1968: 109; Ju, 1969: 114 (N. Korea); Gu, 1973: 49; Alexeev, 1989: 486 (N. Korea); Kim et al., 1994b: 157; Hua, 2002: 90; Boo et al., 2003: 100; Jendek, 2006c: 394 (N. Korea).

Korean names. 사과호리비단벌레(ZSK 1968), 사과긴구슬벌레(Ju 1969),

사과긴비단벌레(Kim et al. 1994), 사과나무(긴)구슬벌레(Boo et al. 2003).

Description. Body length about 6.4-6.8 mm; subcylindrical, robust about 3.4 times as long as wide. Dorsal side slightly lustrous, almost glabrous; head, pronotum and elytra dull red; elytra with a pair of white tomentose spots at posterior third of elytral sutural impressions; abdominal tergites deep blue; abdominal laterosternites dark brown. Vental side dark brown, more lustrous. Head slightly narrower than base of pronotum; frons almost flat with concentric rugous and fine median sulcus in frontal view; vertex with obscure median sulcus and straight punctate striae occasionally arcuate; antennae serrate from the fourth segment. Pronotum transverse about 1.4 times as wide as long, widest at middle to posterior third; median groove well pronounced, separated by transverse elevation; scutellum transverse carina prominent. Elytra elongate about 3.1 times as long as wide, widest at posterior third; apices separately rounded. Abdominal tergites III-V slightly grooved medially without carinae; tergite VI with distinct longitudinal median carina; tergite VII with distinct longitudinal median carina, not extending beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons dull brown; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad . Prosternal process with dense and long white pubescence. **[Female]** Frons reddish brown; frontal lateral margins weakly S-shaped between eyes, less narrowed anteriad. Prosternal process with sparse and short white pubescence.

Distribution. Korea, Russia (East Siberia & Far East), China (Beijing,

Gansu, Guangxi, Hebei, Heilongjiang, Henan, Hubei, Qinghai, Sichuan, Shandong & Xizang) and Mongolia.

Host plants. *Juglans regia* 호두나무, *Malus pumila* 사과나무, *M. spectabilis*, *Prunus armeniaca*, *P. persica* 복숭아나무, *Pyrus* spp. and *Salix* spp. (Hua 2002).

Specimens examined. [GG] 1♀, Suwon-si, 20 VI 1923, M Ochi; 1♂1♀, Suwon-si, 25 VI 1923, M Eguchi; 1♂, ibid., 26 VII 1925, T Hanaya; 4♂2♀, Cheongnyang-ri Dongdaemun-gu Seoul-si, 12 VII 1940, Cho PS.

Subgenus *Uragrilus* Semenov
긴꼬리호리비단벌레아속(신칭)

Agrilus (*Uragrilus*) Semenov, 1935: 276.

Type species: *Agrilus guerini* Lacordaire, 1835.

Diagnosis. Body length 4.0-13.0 mm; Eyes noticeably protruding beyond head contour. Frons narrowed anteriad or parallel-sided. Vertex with concentric pattern of punctate striae occasionally indistinct laterally at base. Pronotum 1.4-1.6 times as long as wide (actually as wide as long - editor's note); antero- and posteromedian pronotal impressions usually well pronounced, separated by median elevation, rarely connected by narrow and shallow sulcus; carinae at posterior corners of pronotum no longer than half of pronotum, often indistinct, absent or replaced by elongate tubercles; marginal and submarginal carinae converging but not

merged posteriorly; submarginal carinae not reaching to posterior margin of pronotum. Elytra without bolsters along outer margin of sutural impressions. Median carina of last abdominal tergite commonly protruding beyond its posterior margin in form of a fine parallel-sided triquetrous process transversely truncate at apex, extremely rarely running above marginal tergal welt extending only to its edge. Posterior prosternal process with a brush of rather short, white, shining, setiform scales. Male abdomen without paired, posteriorly hacked tubercles behind the middle of the suture between 1st and 2nd visible sternites. **[Male]** Aedeagus commonly narrow, extremely rarely with strongly widened parameres; parameres and posterior part of tegminal tube without spinform, very short, reclinate setae. Penis parallel-sided, narrow or wide; with large, occasionally very long (more than 1/4 penis length) apodeme. Terminal part of ejaculatory duct provided only with basal ring-shaped structure bearing two posteriorly diverging, sclerotized cords and usually weakly sclerotized strips, without complex sclerotized structures, chambers, or capsules around and inside basal ring-shaped structure.

Distribution. Palaearctic (European, Siberian & Mancurian subregions), Oriental, Afrotropical and Nearctic regions.

Key to the species of the subgenus *Uragrilus*

1. Elytra without tomentose spots ····· ***planipennis***
− Elytra with three or four pairs of tomentose spots ····· **2**
2. Elytra apices with sharp median spine ····· ***tokyoensis***

– Elytra apices without distinct median spine ····· **3**

3. Small to middle sized (5.6-8.3 mm); pronotum widest at near anterior angles ····· ***rokuyai***

– Middle to large sized (6.5-11.0 mm); pronotum widest at posterior third ····· **4**

4. Pronotal lateral depressions with distinct white tomentose spots ··· ***ater***

– Pronotla lateral depressions without distinct white tomentose spots ····· ***fleischeri***

46. *Agrilus* (*Uragrilus*) *ater* (Linnaeus)

육점박이호리비단벌레

[Pls. III-l, VII-h]

Buprestis atra Linnaeus, 1767: 663.

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus ater***: Alexeev, 1989: 482 (N. Korea); Kim et al., 1994b: 156.

Korean name. 육점박이호리비단벌레(Kim et al. 1994b).

Description. [Male] Body length about 7.7 mm; subcylindrical, robust about 3.5 times as long as wide. Head slightly narrower than the base of pronotum; frons almost flat with concentric rugous and fine median sulcus in frontal view; vertex strongly grooved medially with concentric pattern of punctate striae occasionally indistinct laterally at the base;

antennae serrate from the fourth segment. Pronotum transverse about 1.6 times as wide as long, widest at the posterior third. Elytra elongate about 3.1 times as long as wide, widest at the humeri. Abdominal tergite VII with distinct longitudinal median carina, extending beyond posterior margins; abdominal sternite V feebly incurved apically. Frons yellow green; frontal lateral margins strongly S-shaped between eyes, more narrowed anteriad. Prosternal process with dense and long white pubescence. Abdominal sternites I and II with distinct longitudinal median groove.

Distribution. Korea and Europe.

Host plants. *Populus alba* 은백양, *P. canadiensis*, *P. nigra*, *P. tremula* and *Salix alba* (Bílý 2002).

Additional specimens examined. [Estonia] 1♂, Särvselija, (?), V Nagirngi.

Remarks. This species was reported for the first time in North Korea by Alexeev (1998) without particular records. The other record was just quotation from the record. I could not find Korean specimens in this study. So, further studies and Korean specimens are needed. Description based on one foreign specimen.

47. *Agrilus* (*Uragrilus*) *fleischeri* Obenberger stat. nov.

관모봉호리비단벌레

[Pls. IV-a, VII-i]

Agrilus fleischeri Obenberger, 1925: 33-34 (Russia). LT ♂ in NMP.

See Jendek (2006c) for more synonymy and references.

Korean records. ***Agrilus fleischeri coreicus*** Y. Kurosawa, 1954: 92 (N. Korea); ***A. fleischeri***: Kurosawa, 1963a: 111 (N. Korea); Kurosawa, 1963b: 152 (N. Korea); Tôyama, 1985b: 24; Kim et al., 1994b: 157; Akiyama and Ohmomo, 1997: 33; Akiyama and Ohmomo, 2000: 272; Hua, 2002: 89; Jendek, 2006c: 398; ***A. fletscheri*** [sic]: Ju, 1969: 114 (N. Korea).

Korean names. 씨베리긴구슬벌레(Ju 1969), 관모봉호리비단벌레(Kim et al. 1994b).

Description. Body length about 10.1-11.0 mm; subcylindrical, robust about 3.5-3.6 times as long as wide. Dorsal side slightly lustrous; head and pronotum blackish blue or blackish brown; elytra blackish blue; abdominal laterotergites with large white tomentose spots. Ventral side blackish brown with a lustrous. Frons almost flat; vertex slightly convex, strongly grooved medially with fine concentric lines of small punctures; eyes large. Pronotum transverse, about 1.5 times as wide as long, widest at poseterior third; sides regularly curved; prehumeral carinae well developed, reaching almost to middle of pronotum; medial pronotal groove divided into a shallow anterior V-shape depression and a posterior square depression; prosternal process with parallel margins. Scutellar transverse carina well developed. Elytra 2.9 times as long as wide at humeri, slightly acuminate in posterior third, with three pairs of white tomentose spots; apices slightly serrated, with a finely medial spine. Abdominal tergite VII with longitudinal median carina, extended beyond posterior margin in the form of a blunt spine. **[Male]** Eyes large, more

convex. Frons blackish blue with a lustrous. Frontal and prosternal pubescence dense and long. Abdominal sternite slightly incurved apically. **[Female]** Eyes smaller, almost flat. Frons blackish brown with feebly coppery lustrous. Frontal and prosternal pubescence rather sparser and shorter. Abodominal sternite V rounded apically.

Distribution. Korea, Russia (East Siberia & Far East), China (Beijing, Heilongjiang, Sichuan & Shaanxi), Mongolia, Japan (Hokkaido & Honshu) and Europe (Kazakhstan).

Host plant. Unknown.

Specimens examined. [GW] 1♂3♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 7 VII 2003, Oh HY.

48. *Agrilus* (*Uragrilus*) *planipennis* Fairmaire

서울호리비단벌레

[Pls. IV-b, VII-j]

Agrilus planipennis Fairmaire, 1888: 121 (China). LT ♀ in MNHN.

Agrilus marcopoli Obenberer, 1930: 108-109. [syn. by Jendek 1994: 21]

Korean records. ***Agrilus marco-poli*** [sic]: Kurosawa, 1956: 40 (S. Korea); ***A. marcopoli***: Kurosawa, 1963b: 153; Ju, 1969: 114 (N. Korea); Tôyama, 1985b: 23; Kim et al., 1994b: 157; An, 1996: 37; An, 2001: 45; ***A. marcropoli*** [sic]: Yoon et al., 1990: 111; ***A. planipennis***: Akiyama and Ohmomo, 1997: 37; Akiyama and Ohmomo, 2000: 275; Haack et al., 2002: 2; Liu et al., 2003: 192; Wei et al., 2004: 680-681; Jendek,

2006c: 395 (S. Korea); ***A. macropoli*** [sic]: Hua, 2002: 90.

Korean name. 서울호리비단벌레(Yoon et al. 1990).

Description. Body length about 9.5-13.5 mm; subcylindrical, elongate. Dorsal side lustrous; head and pronotum brassy or golden green, mostly brigther than elytra; elytra golden green or emerald green. Ventral side lustrous, the same colored as dorsum. Frons strongly grooved medially with short and dense black pubescence; vertex strongly grooved medially with concentric rugose. Pronotum about 1.5 times as wide as long, widest at posterior third with two shallow depressions medially. Scutellar transverse carina well developed. Elytra apices rounded with strikingly serrata. Abdominal tergite VII with a median longitudinal carina, extended beyond posterior margin in the form of a blunt spine. Abdominal sternite V rounded apically.

Distribution. Korea, Russia (Far East), Mongolia, China (Beijing, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Sichuan, Shandong & Tianjin), Japan (Hokkaido, Honshu, Shikoku & Kyushu), Taiwan, Introduced to Canada and USA.

Host plants. *Fraxinus americana* 미국물푸레, *F. chinensis* var. *chinensis*, *F. c.* var. *rhynchophylla*, *F. mandshurica* 들메나무, *F. m.* var. *japonica*, *F. nigra*, *F. pennsylvanica* 붉은물푸레나무, *Juglans mandshurica* var. *sieboldiana* 왕가래나무, *J. m.* var. *sachalinensis*, *Pterocarya rhoifolia* 개굴피나무 and *Ulmus davidiana* var. *japonica* 느릅나무 (Haack et al 2002).

Specimens examined. [GG] 1♂, Bogwangsa Gangtan-myeon Paju-si, 6 VII 1982, Kim YS; 1♀, ibid., 9 VI 1987, Myeong HG; 1♂, Anam-dong

Seongbuk-gu Seoul, 10 VI 1983, Yoon JS. **[GW]** 1ex., Jinburyeong, 11 VIII 1979, Han HS; 1♀, Gojindong *valley* Mt. Geonbongsan Goseong-gun, 5 VII 1995, Kim JI; 1♀, Changwon3-ri Nam-myeon Yeongwol-gun, 3 VI 1999, Kim MA. **[CN]** 1♀, Mt. Gyeryongsan Gongju-si, 9 VIII 1993, An SL.

49. *Agrilus* (*Uragrilus*) *rokuyai* Y. Kurosawa

어리흰점호리비단벌레(신칭)

[Pls. IV-c, VII-k]

Agrilus rokuyai Y. Kurosawa, 1976: 134-136, fig. 1 (Japan). HT ♂ in NSMT.

Korean record. ***Agrilus yamawakii***: Kim and Kim, 1972: 78. [misidentification]

Description. Body length about 5.6-8.3 mm; subcylindrical, elongate. Dorsal side mat; entirely blackish brown; elytra with distinct three pairs of white tomentose spots. Ventral side light blackish brown with a lustrous. Frons feebly convex; vertex slightly grooved medially with longitudinal lines composed of fine punctures; eyes large. Pronotum transverse, about 1.5 times as wide as long widest just behind the anterior margin, attenuate posteriorly; medial pronotal groove divided into a shallow anterior transverse depression and an elongate posterior depression; prehumeral pronotal carinae very obsolete. Scutellar transvsre carina well developed. Elytra about 3.1 times as long as wide at humeri, widest at

posterior third; apices feebly serrate. Abdominal sternite V rounded apically. **[Male]** Prosternal process with dense and long whitish pubescence. **[Female]** Prosternal process with short and sparse whitish pubescence.

Distribution. Korea **(new record)**, China (Shaanxi) and Japan (Honshu).

Host plants. *Quercus* spp. (Akiyama & Ohmomo 1997).

Specimens examined. [GG] 1♂, Mt. Cheonggyesan Seocho-gu Seoul-si, 7 VI 1993, Kim EH; 1♀, ibid., 21 V 2002, Kim SM; 1♂, Mt. Dobongsan Dobong-gu Seoul-si, 22 V 1994, Sohn IP; 1♀, Namhansanseong Seongnam-si, 6 VI 1996, Jang SY; 1♂2♀, Mok-dong Yangcheon-gu Seoul-si, 17 V 1997, Lee JH; 1♂, Gangssibong Ildong-myeon Pocheon-gun, 18 VII 1997, Kim JI and Kim SY. **[GW]** 1♀, Sammachi-ri Hongcheon-eup Hongcheon-gun, 25 VI 2005, Lee JG. **[CB]** 1♀, Daemun-ri Baekgok-myeon Jincheon-gun, 7 VII 1998, Han TM. **[CN]** 1♂1♀, Donam-ri Banpo-myeon Gongju-si, 21-28 VI 2005, Anonym, *ex*. Malaise trap; 1♀, ibid., 28 VI ~ 5 VII 2005, Anonym, *ex*. Malaise trap. **[JB]** 1♀, Gucheondong *valley* Dugil-ri Seolcheon-myeon Muju-gun, 10 VI 1972, Ryu JH; 1♂, Oknyeobong Unsan-ri Hwasan-myeon Wanju-gun, 22 VII 1997, Kim JI et al. **[GN]** 1♀, Gajwa-dong Jinju-si, 6 ~ 12 V 1989, Anonym; 1♀, Sunduryu Mt. Jirisan Jungsan-ri Sicheon-myeon Sancheong-gun, 3 VI 1989, Seo GY; 1♂1♀, ibid., 27 VI ~ 3 VII 1989, Anonym; 1♀, Mt. Gajisan Sangbuk-myeon Ulju-gun, 28 VI 1989, Ahn JH.

50. *Agrilus* (*Uragrilus*) *tokyoensis* Y. Kurosawa

북한산호리비단벌레(신칭)

[Pl. IV-d]

Agrilus tokyoensis Y. Kurosawa, 1985: 151-153, figs. 3a-b (Japan). HT ♂ in NSMT.

Description. **[Female]** Body length about 9.6-9.7 mm; subcylindrical, elongate about 3.6 times as long as wide. Dorsal side lustrous; head and pronotum blue green; elytra blue, slightly greenish or bronzy tinge with three pairs of white tomentose spots; abdominal laterotergite I with distinct white tomentose spots. Ventral side greenish brown, more brighter than dorsum. Head slightly narrower than base of pronotum; frons convex, vertex slightly grooved medially with longitudinal lines composed of fine punctures; eyes large. Pronotum transverse, about 1.4 times as wide as long widest at anterior third; sides incurved from middle to posterior angles; prehumeral carina short, strongly bent, convergence to posterior third of the marginal carina. Scutellar transverse carina well developed. Elytra about 3.2 times as long as wide, widest at humeri; apices strongly serrated, with a finely medial spine. Abdominal tergite VII with longitudinal median carina, extended beyond posterior margin in th form of a blut spine; abdominal sternite V rounded apically.

Distribution. Korea **(new record)** and Japan (Honshu & Kyushu).

Host plant. *Quercus acutissima* 상수리나무 (Kurosawa 1985; Akiyama &

Ohmomo 1997).

Specimens examined. [GG] 1♀, Hyoja-dong Jongno-gu Seoul-si, 9 VII 1946, Cho PS; 1♀, Mt. Bukhansan Gugi-dong Jongno-gu Seoul-si, 22 VII 2005, Lee JG.

Remarks. Only female specimens were examined in this study. So, further studies and male specimens are needed. This species is newly recorded from Korea.

Subgenus *Xeragrilus* Alexeev, 1998
민호리비단벌레아속(신칭)

Agrilus (*Xeragrilus*) Alexeev, 1998: 375.

Type species: *Agrilus sericans* Kiesenwetter, 1857.

Diagnosis. Body length 3.6-8.4 mm. The entire body covered with white, or yellowish, shining seti form scales. Frons with rather weakly S-shaped margins between eyes, wide, strongly narrowed anteriad, rather convex; longitudinal impression entire, often rather deep. Vertex with punctate striae forming concentric pattern. Antero- and posteromedian pronotal impressions separated by transverse elevation; carinae at posterior corners fine, slightly sinuous, somewhat distant from one another, usually merged with carinae at anterior corners to form a common carina, very rarely obsolete or absent; marginal and submarginal pronotal carinae weakly arcuately curved or nearly straight, parallel along entire length, or slightly

converging in posterior half, then parallel; submarginal carina always extending to posterior margin of pronotum. Last abdominal tergite with poorly developed median longitudinal carina vanished to the middle; last abdominal sternite widely roundly triangular. **[Male]** Aedeagus narrow, strongly sclerotized; tegminal tube expanded before the widened, apically narrowed, or parallel-sided parameres clothed with very short and reclinate spiniform scales covering membranous and sclerotized parts of parameres. Penis narrow, parallel-sided, with galeate apodeme; ejaculatory duct with terminal droplike capsule and basal ring-shaped structure giving rise laterally to fine undulate cords extending far backwards and bearing fine perpendicular rod-shaped process.

Distribution. Palaearctic region (European, Siberian, Mediterranean & Manchurian subregions).

51. *Agrilus* (*Xeragrilus*) *ecarinatus* Marseul

민호리비단벌레

[Pls. IV-e, VII-l]

Agrilus ecarinatus Marseul, 1866: 439, 484-485 (Russia). LT (sex not examined) in MNHN.

See Jendek (2006c) for more synonymy and references.

Korean Records. ***Agrilus ecarinatus***: Alexeev, 1989: 481 (N. Korea); Kim et al., 1994b: 156; Jendek, 2006c: 396 (N. Korea).

Korean name. 민호리비단벌레(Kim et al. 1994b).

Description. Body length about 5.6-6.0 mm; subcylindrical, robust about 3.2-3.4 times as long as wide. Dorsal side mat; entirely dull yellow green with white pubescence. Ventral side slightly lustrous, the same color as dorsum. Head slightly narrower than base of pronotum; frons feebly convex with concentric rugous, shallow transverse depression and distinct median sulcus in frontal view; vertex strongly grooved medially with concentric rugous; eyes small; antennae serrate from the fourth segment. Pronotum transverse about 1.4-1.5 times as wide as long, widest at middle; sides regularly arcuate; antero- and posteromedian depressions well pronounced, separated by transverse elevation; prehumeral carinae obtuse and indistinct; marginal and submarginal carinae almost straight along entire length; submarginal carinae extending to posterior margin of pronotum. Elytra elongate about 2.7-2.8 times as long as wide, about equal in width at humeri and posterior third. Abdominal tergite III feebly grooved medially; tergites IV-VI almost flat without median carina or groove; tergite VII with feeble longitudinal median carina, not extended beyond posterior margins; abdominal sternite V rounded apically. **[Male]** Frons greenish brown, more lustrous; frontal lateral margins weakly S-shaped between eyes, narrowed anteriad. Prosternal process with dense and long white pubescence. **[Female]** Frons blackish brown; frontal lateral margins narrowed anteriad.

Distribution. Korea, Russia (East Siberia, Far East & West Siberia), Mongolia and China (Beijing, Gansu, Hebei, Northeast Territory, Northern Territory, Nei Mongol, Sichuan, Shaanxi, Shanxi & Xizang).

Host plant. Unknown.

Specimens examined. [GW] 1♀, Dalbangdaem Samheung-dong Donghae-si, 26 VI 2001, Kim MA. **[GB]** 1♂, Daehyeon-ri Seokpo-myeon Bonghwa-gun, 24 VII 1986, Jang GS; 3♂, Mt. Duwibong Jeongseon-gun, 21 VI 2000, An SL.

3. 고찰

본 연구를 통하여 이루어진 한국산 호리비단벌레속의 연구결과를 종합적으로 분석해보면 다음과 같다.

1) 한국산 미기록 종 및 아종: 본 연구 결과 한국산으로 분포가 새로이 알려지는 종 및 아종으로 다음과 같다.

1. *Agrilus* (s. str.) *viduus subviduus* Y. Kurosawa, 1957
2. *A*. (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956
3. *A*. (*D*.) *cyanescens* Ratzeburg, 1837
4. *A*. (*Q*.) *fissus* Obenberger, 1917
5. *A*. (*Q*.) *marginicollis* E. Saunders, 1873
6. *A*. (*Q*.) *varius* Kerremans, 1895.
7. *A*. (*Uragrilus*) *rokuyai* Y. Kurosawa, 1976
8. *A*. (*U*.) *tokyoensis* Y. Kurosawa, 1963
9. *A*. *daimio* Obenberger, 1936
10. *A*. *plasoni* Obenbeger, 1917

2) 한국산 표본 미확인 종 및 아종: 문헌상의 기록은 있으나 본 연구에서 한국산 표본을 확인하지 못한 종 및 아종으로 다음과 같다.

1. *A*. (s. str.) *cuprescens* (Ménétriés, 1832)
2. *A*. (s. str.) *ribesi* Schaefer, 1946
3. *A*. (s. str.) *salicivola* Y. Kurosawa, 1963
4. *A*. (s. str.) *viduus chinganicus* Obenberger, 1922
5. *A*. (*Dentagrilus*) *pooli* Théry, 1936

6. *A*. (*Robertius*) *delphinensis* Abeille de Perrin, 1897

7. *A*. (*R*.) *nicolanus* Obenberger, 1924

8. *A*. (*R*.) *pekinensis* Obenberger, 1924

9. *A*. (*R*.) *sibiricus* Obenberger, 1912

10. *A*. (*Sinagrilus*) *coreanus* Obenberger, 1936

11. *A*. (*Uragrilus*) *ater* (Linnaeus, 1767)

12. *A*. *quadrisignatus* Marseul, 1866

이들은 한국산 표본을 확인하지 못한 종들로서, *Agrilus* (*Uragrilus*) *ater* (Linnaeus, 1767)를 제외한 이들 대부분은 한반도 북부 또는 인접국가(극동러시아, 중국, 일본)에 분포하는 종으로, 이후에 발견 가능성을 배재할 수 없으며, 재조사가 요구된다.

3) 분포가 의심되는 종

Agrilus ater (Linnaeus, 1767). 본 종은 극동지역보다는 유럽에 널리 분포하는 종으로, 한국 기록은 Alexeev (1989)에 의한 것이 유일하며, 국내의 *A*. *fleischeri*와 매우 유사한 종으로 오동정이었을 가능성이 매우 크다.

한국산 호리비단벌레속은 인접국가인 일본의 110종과 러시아의 95종에 비해 매우 적은 종 수가 보고된 실정이다. 이는 지금까지 우리나라에 호리비단벌레속에 대한 전문가가 없었던 것과 작은 개체 크기와 채집상의 어려움, 또는 한정된 채집방법 등에 의한 많은 표본의 축적이 없었던 것으로 사료된다. 앞으로 다양한 채집방법과 이 분류군에 대한 많은 연구가 이루어진다면 훨씬 많은 종 수가 추가될 것이다.

V. 결 론

본 연구는 이전까지 국내에서 신뢰할만한 연구 결과가 부재하였던 한국산 호리비단벌레속(딱정벌레목 : 비단벌레과 : 호리비단벌레아과)을 분류학적으로 검토하였다. 본 연구는 기존의 혼동되어 온 많은 한국산 호리비단벌레속의 오동정과 동물이명의 정리를 통해 새로이 종 목록을 작성하고 이들 종에 대한 신뢰할 수 있는 분류학적 정보를 제공하여, 이를 통해 국내 곤충상 연구에서 올바른 학명의 적용과 함께 새로운 분류학적 접근을 가능하게 하는데 그 목적을 두었다.

한국산 호리비단벌레속은 Muramatsu (1924)에 의해 처음 1종이 기록된 이후, 현재까지 각종 문헌을 통해 모두 47종 5아종의 학명이 보고되었다. 그러나 이중에는 많은 오동정, 동물이명 등이 포함되어 있다. 각 대학과 연구기관 등에 소장된 과거로부터 현재까지의 표본 약 1,500여 개체에 대한 형태적 형질 분석을 통해 각 종명의 타당성 여부를 검토한 결과, 2007년 5월 이전까지 한국산으로 적합한 학명은 모두 42종이었으며, 이번 연구 과정에서 새롭게 추가된 한국산미기록 9종 1아종은 아래와 같다.

1. *Agrilus* (s. str.) *viduus subviduus* Y. Kurosawa, 1957
2. *A*. (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956
3. *A*. (*D*.) *cyanescens* Ratzeburg, 1837
4. *A*. (*Q*.) *fissus* Obenberger, 1917
5. *A*. (*Q*.) *marginicollis* E. Saunders, 1873
6. *A*. (*Q*.) *varius* Kerremans, 1895.
7. *A*. (*Uragrilus*) *rokuyai* Y. Kurosawa, 1976

8. *A*. (*U*.) *tokyoensis* Y. Kurosawa, 1963

9. *A*. *daimio* Obenberger, 1936

10. *A*. *plasoni* Obenbeger, 1917

결과적으로 한국산 호리비단벌레속은 51종 1아종으로 정리된다. 연구 결과에 따라 각 종에 대한 검색표와 형태, 기재, 문헌, 채집지, 생물학적 정보 등을 제시하였다.

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ABSTRACT

Taxonomic study of the genus *Agrilus* (Coleoptera: Buprestidae: Agrilinae) in Korea

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To clarify taxonomy of the genus *Agrilus* (Coleoptera: Buprestidae: Agrilinae) in Korea, this study was conducted.

Fourty seven species and four subspecies has been recored in Korean *Agrilus* fauna, since Muramatsu (1924) reported 1 species of Korean *Agrilus* for the first time. But researches of Korean *Agrilus* have included not only many problems such as misidentification, synonyms and dubious names but also rare information of distribution and identification.

As a result of this investigation, validity of fourty two species were confirmed. In addition, nine species and one subspecies are newly recored in Korea. Total fifty one species and one subspecies were redescribed by alalysis of morphological charactrers.

Consequently, it is report that Korean *Agrilus* is consist of fifty one species including one subspecies. The describtions, localities and hostplants information of each species are provided.

Explanation of plates

Plate I. Habitus (dorsal aspect)

a. *Agrilus chujoi* Y. Kurosawa, 1985

b. *A. daimio* Obenberger, 1936

c. *A. decoloratus alazon* Lewis, 1893

d. *A. discalis* E. Saunders, 1873

e. *A. euonymi* Tôyama, 1985

f. *A. imitans* Lewis, 1893

g. *A. plasoni* Obenberger, 1917

h. *A. sospes* Lewis, 1893

i. *A. spinipennis* Lewis, 1893

j. *A. subrobustus* E. Saunders, 1873

k. *A. ventricosus* Fairmaire, 1888

l. *A. yamawakii* Y. Kurosawa, 1957

Plate II. Habitus (dorsal aspect)

a. *Agrilus* (s. str.) *suvorovi* Obenberger, 1935

b. *A*. (s. str.) *viduus subviduus* Y. Kurosawa, 1957

c. *A*. (s. str.) *viridis* (Linnaeus, 1758)

d. *A*. (*Anambus*) *cyaneoniger* E. Saunders, 1873

e. *A*. (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956

f. *A*. (*D*.) *cyanescens* (Ratzeburg, 1873)

g. *A*. (*Orientagrilus*) *tempestivus* Lewis, 1893

h. *A*. (*Pseudoquercagrilus*) *asiaticus* Kerremans, 1898

i. *A*. (*Quercuagrilus*) *adelphinus* Kerremans, 1895

j. *A*. (*Q*.) *fissus* Obenberger, 1917

k. *A*. (*Q*.) *friebi* Obenberger, 1922

l. *A*. (*Q*.) *marginicollis* E. Saunders, 1873

Plate III. Habitus (dorsal aspect)

a. *Agrilus* (*Quercuagrilus*) *ribbei* Kiesenwetter, 1879

b. *A*. (*Q*.) *ussuricola* Obenberger, 1924

c. *A*. (*Q*.) *varius* Kerremans, 1895

d. *A*. (*Robertius*) *komareki* Obenberger, 1925

e. *A*. (*R*.) *moerens* E. Saunders, 1873

f. *A*. (*R*.) *peregrinus* Kiesenwetter, 1879

g. *A*. (*R*.) *pseudocyaneus* Kiesenwetter, 1857

h. *A*. (*R*.) *smaragdinus* Solsky, 1876

i. *A*. (*R*.) *soudeki* Obenberger, 1925

j. *A*. (*R*.) *subauratus amurensis* Obenberger, 1922

k. *A*. (*Sinuatiagrilus*) *mali* Matsumura, 1924

l. *A*. (*Uragrilus*) *ater* (Linnaeus, 1767)

Plate IV. Habitus (dorsal aspect)

a. *Agrilus* (*Uragrilus*) *fleischeri* Obenberger, 1925

b. *A*. (*U*.) *planipennis* Fairmaire, 1888

c. *A*. (*U*.) *rokuyai* Y. Kurosawa, 1976

d. *A*. (*U*.) *tokyoensis* Y. Kurosawa, 1985

e. *A*. (*Xeragrilus*) *ecainatus* Marseul, 1866

Plate V. Aedeagi (dorsal aspect)

a. *Agrilus chujoi* Y. Kurosawa, 1985

b. *A. decoloratus alazon* Lewis, 1893

c. *A. discalis* E. Saunders, 1873

d. *A. euonymi* Tôyama, 1985

e. *A. imitans* Lewis, 1893

f. *A. plasoni* Obenberger, 1917

g. *A. sospes* Lewis, 1893

h. *A. spinipennis* Lewis, 1893

i. *A. subrobustus* E. Saunders, 1873

j. *A. yamawakii* Y. Kurosawa, 1957

k. *A.* (s. str.) *viduus subviduus* Y. Kurosawa, 1957

l. *A.* (s. str.) *viridis* (Linnaeus, 1758)

Plate VI. Aedeagi (dorsal aspect)

a. *Agrilus* (*Anambus*) *cyaneoniger* E. Saunders, 1873

b. *A*. (*Dentagrilus*) *asahinai* Y. Kurosawa, 1956

c. *A*. (*D*.) *cyanescens* (Ratzeburg, 1873)

d. *A*. (*Orientagrilus*) *tempestivus* Lewis, 1893

e. *A*. (*Pseudoquercagrilus*) *asiaticus* Kerremans, 1898

f. *A*. (*Quercuagrilus*) *adelphinus* Kerremans, 1895

g. *A*. (*Q*.) *fissus* Obenberger, 1917

h. *A*. (*Q*.) *friebi* Obenberger, 1922

i. *A*. (*Q*.) *marginicollis* E. Saunders, 1873

j. *A*. (*Q*.) *ribbei* Kiesenwetter, 1879

k. *A*. (*Q*.) *ussuricola* Obenberger, 1924

l. *A*. (*Robertius*) *komareki* Obenberger, 1925

Plate VII. Aedeagi (dorsal aspect)

a. *Agrilus* (*Robertius*) *moerens* E. Saunders, 1873

b. *A*. (*R*.) *peregrinus* Kiesenwetter, 1879

c. *A*. (*R*.) *pseudocyaneus* Kiesenwetter, 1857

d. *A*. (*R*.) *smaragdinus* Solsky, 1876

e. *A*. (*R*.) *soudeki* Obenberger, 1925

f. *A*. (*R*.) *subauratus amurensis* Obenberger, 1922

g. *A*. (*Sinuatiagrilus*) *mali* Matsumura, 1924

h. *A*. (*Uragrilus*) *ater* (Linnaeus, 1767)

i. *A*. (*U*.) *fleischeri* Obenberger, 1925

j. *A*. (*U*.) *planipennis* Fairmaire, 1888

k. *A*. (*U*.) *rokuyai* Y. Kurosawa, 1976

l. *A*. (*Xeragrilus*) *ecainatus* Marseul, 1866

Plate I

a

b

c

d

e

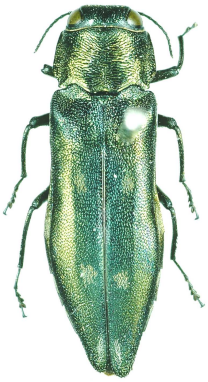
f

g

h

i

j



k

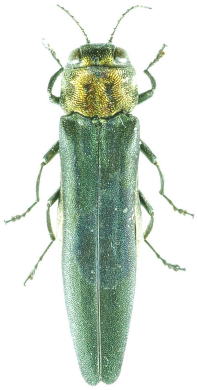
l

Plate II

a

b

c



d

e

f

g

h

i

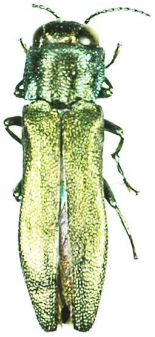
j

k

l

Plate III

a

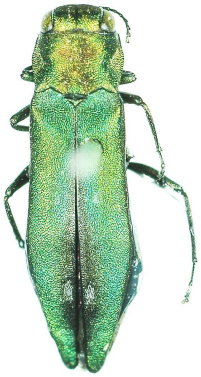


b

c

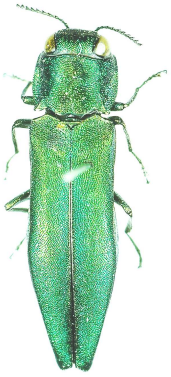
d

e



f

g



h

i

j

k

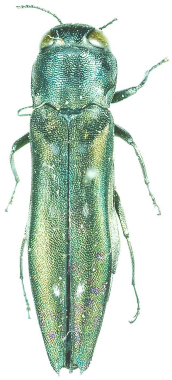
l

Plate IV

a

b

c



d

e

Plate V

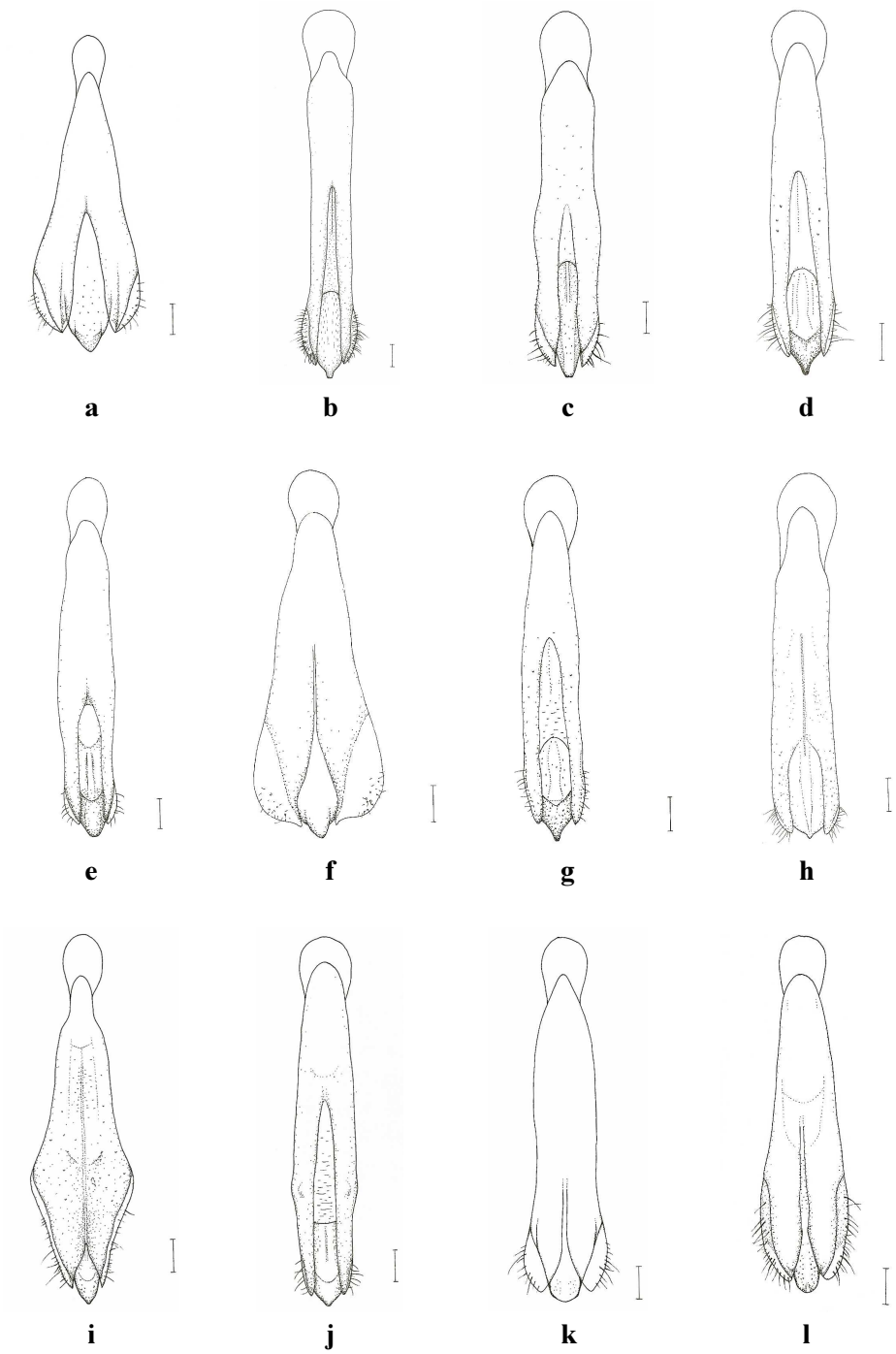


Plate VI

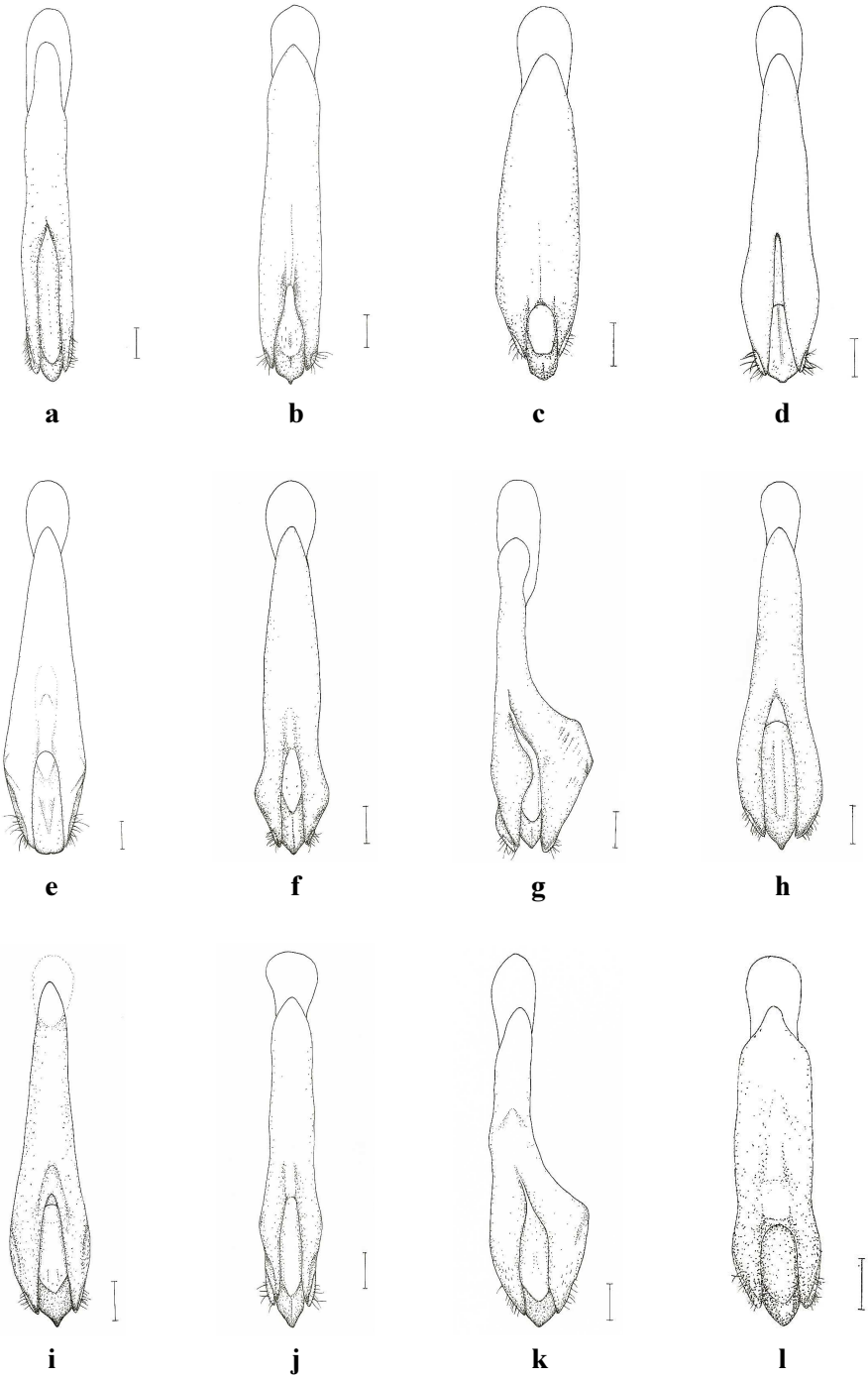
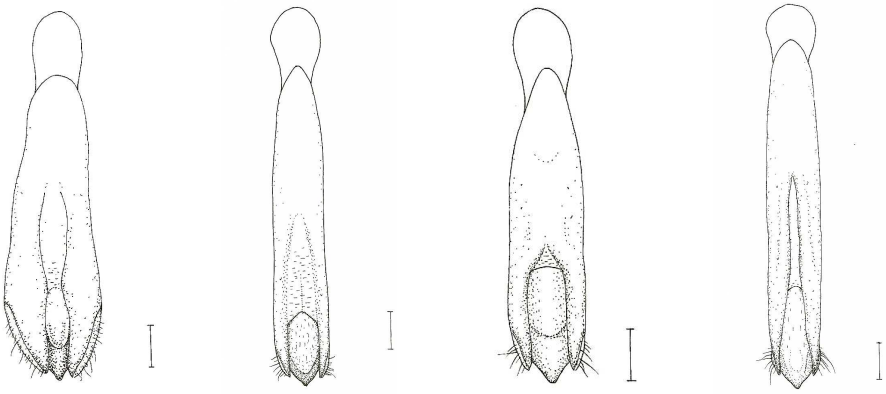
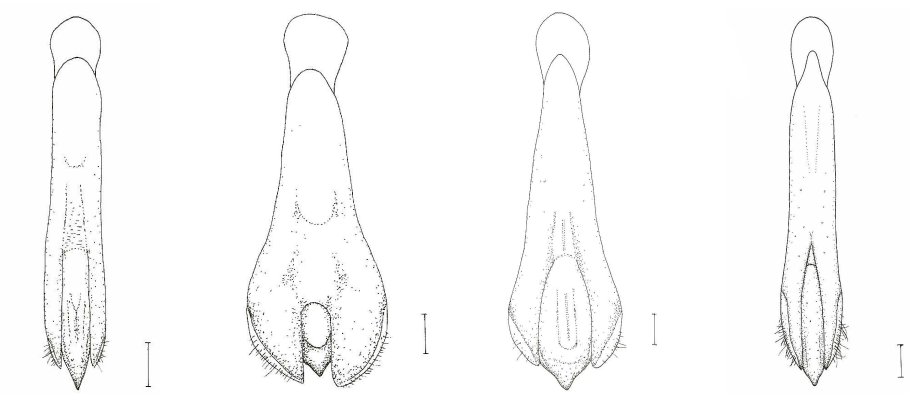


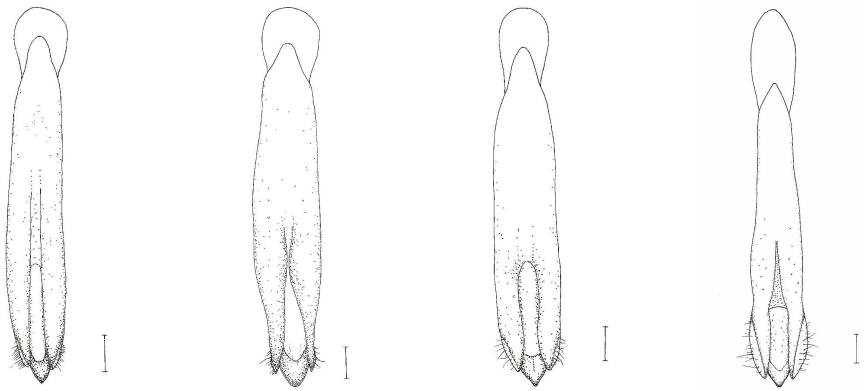
Plate VII



a b c d



e f g h



i j k l

감사의 글

어린 시절부터 좋아하던 곤충이 어느덧 대학원까지 이어져 짧은 공부를 마치고 이렇게 작은 논문을 쓰게 되었습니다. 이 자리를 빌어 결실을 맺을 수 있게 도와주신 모든 분들게 깊은 감사를 드리고 싶습니다.

우선 부족한 저를 제자로 받아주시고, 참된 학자의 모습을 몸소 보여주시며, 본 논문이 나올 수 있게 때론 저를 호되게 끌어주시던 김진일 교수님께 깊은 감사와 존경의 마음을 드립니다. 바쁘신 와중에도 논문 심사을 맡아주시고, 미흡하나마 논문의 모습을 갖출 수 있도록 세심한 지도를 해주신 박해철 박사님과 김미량 박사님께도 깊이 감사드립니다. 또한 많은 관심을 가져주시고 다양한 생물학의 분야를 접할 수 있게 해주신 본교 생물학과의 오용자 교수님, 박경숙 교수님, 강혜순 교수님, 윤진호 교수님, 전용필 교수님, 김인순 교수님께도 감사드립니다.

학부시절 분류학의 기초와 야외경험을 접할 수 있게 해주시고, 망설이던 공부를 계속 할 수 있게 용기를 주신 강원대학교 이우철, 유기억 교수님께 감사드립니다.

연구와 관련해 귀중한 표본의 대여를 흔쾌히 허락해 주시고 조언을 아끼지 않으셨던 경상대학교 박중석 교수님, 영남대학교 이종욱 교수님, 서울대학교 이승환 교수님, 국립중앙과학관 안승락 박사님, 이화여자대학교 자연사박물관 윤석준 선생님, 충남대학교 안기정 교수님, 고려대학교 한경덕 박사님, 농업해충과 이관석 박사님, 중요한 표본을 제공해 주신 오해용님, 강웅님께도 감사드립니다. 또한 연구에 필요한 귀중한 문헌과 표본을 제공해주신 슬로바키아의 Dr. Eduard Jendek, 일본의 Mr. Takaharu Hattori께 감사드립니다

누구보다 가장 가까이에서 저를 도와준 동물분류학 연구실 식구들에게 고마운 마음을 전하고 싶습니다. 언제나 걱정만 끼치던 후배를 따뜻한 관심과 충고로 끌어준 선배님들... 태우형, 태화형, 정부희 선생님과 아영선배, 즐거운 일, 힘든 일 항상 함께 해준 인성이, 낯선 공간에서 쉽게 적응 못하던 저를 많이 도와준 순임이에게도 고마움을 전합니다.

그리고 곤충에 대하여 끊임없이 대화하며 열정을 꾸준히 키워나갈 수 있게 해준 친구 승일, 수길, 정훈이, 후배 윤호와 식물에 관해 시시콜콜한 것까미 물어보며 귀찮게 했던 후배 준수에게도 고마움을 전합니다.

항상 곁에서 따뜻한 힘이 되어주던 상희와 동생이라고 언제나 챙겨주기만하는 큰누나와 작은 누나에게 고마운 마음을 전하고 싶습니다.

끝으로 쉽지만은 않았던 대학원 생활의 가장 큰 버팀목이 되어준 부모님께 깊은 감사의 마음과 함께 이 논문을 바치고 싶습니다.