geosciences

MDPI

Review

Fossil History of Curculionoidea (Coleoptera) from the Paleogene

Andrei A. Legalov [1,2]

[1] Institute of Systematics and Ecology of Animals, Siberian Branch, Russian Academy of Sciences, Ulitsa Frunze, 11, 630091 Novosibirsk, Novosibirsk Oblast, Russia; fossilweevils@gmail.com; Tel.: +7-9139471413
[2] Biological Institute, Tomsk State University, Lenin Ave, 36, 634050 Tomsk, Tomsk Oblast, Russia

Received: 23 June 2020; Accepted: 4 September 2020; Published: 6 September 2020

Abstract: Currently, some 564 species of Curculionoidea from nine families (Nemonychidae—4, Anthribidae—33, Ithyceridae—3, Belidae—9, Rhynchitidae—41, Attelabidae—3, Brentidae—47, Curculionidae—384, Platypodidae—2, Scolytidae—37) are known from the Paleogene. Twenty-seven species are found in the Paleocene, 442 in the Eocene and 94 in the Oligocene. The greatest diversity of Curculionoidea is described from the Eocene of Europe and North America. The richest faunas are known from Eocene localities, Florissant (177 species), Baltic amber (124 species) and Green River formation (75 species). The family Curculionidae dominates in all Paleogene localities. Weevil species associated with herbaceous vegetation are present in most localities since the middle Paleocene. A list of Curculionoidea species and their distribution by location is presented.

Keywords: Coleoptera; Curculionoidea; fossil weevil; faunal structure; Paleocene; Eocene; Oligocene

1. Introduction

Research into the biodiversity of the past is very important for understanding the development of life on our planet. Insects are one of the Main components of both extinct and recent ecosystems. Coleoptera occupied a special place in the terrestrial animal biotas of the Mesozoic and Cenozoics, as they are characterized by not only great diversity but also by their ecological specialization. The largest superfamily in the Coleoptera is the Curculionoidea, which, among beetles, is one of the Main plant consumers. They develop in living or dead tissues of various plant organs as well as in soil, feeding on roots. As an exception, some weevil larvae can develop completely exposed on plants, as well as on the surface of the soil as detritivores or predators.

The purpose of this study is to evaluate the diversity of Curculionoidea in the Paleogene and to show the specificity of faunas in various epochs, ages and localities. This is the first time a review of the Paleogene Curculionoid beetle has been undertaken.

2. Materials and Methods

The Paleogene is the first period of the Cenozoic, consisting of three epochs, the Paleocene, Eocene and Oligocene (Figure 1). The Paleogene started at about 66 Ma and ended around 23 Ma. The Late Cretaceous preceded it. The Miocene (from the Neogene) began after the Paleogene. The Paleocene consists of three ages (Danian, Selandian and Thanetian). The Eocene is subdivided into three subepochs (Early, Middle and Late) with four ages (Ypresian, Lutetian, Bartonian and Priabonian). The Bridgerian stands out for the North American Provincial Ages at the end of the Ypresian and the beginning of the Lutetian. This age corresponds with the Green River Formation. The Oligocene consists of two subepochs (Early and Late) and two ages (Rupelian and Chattian).

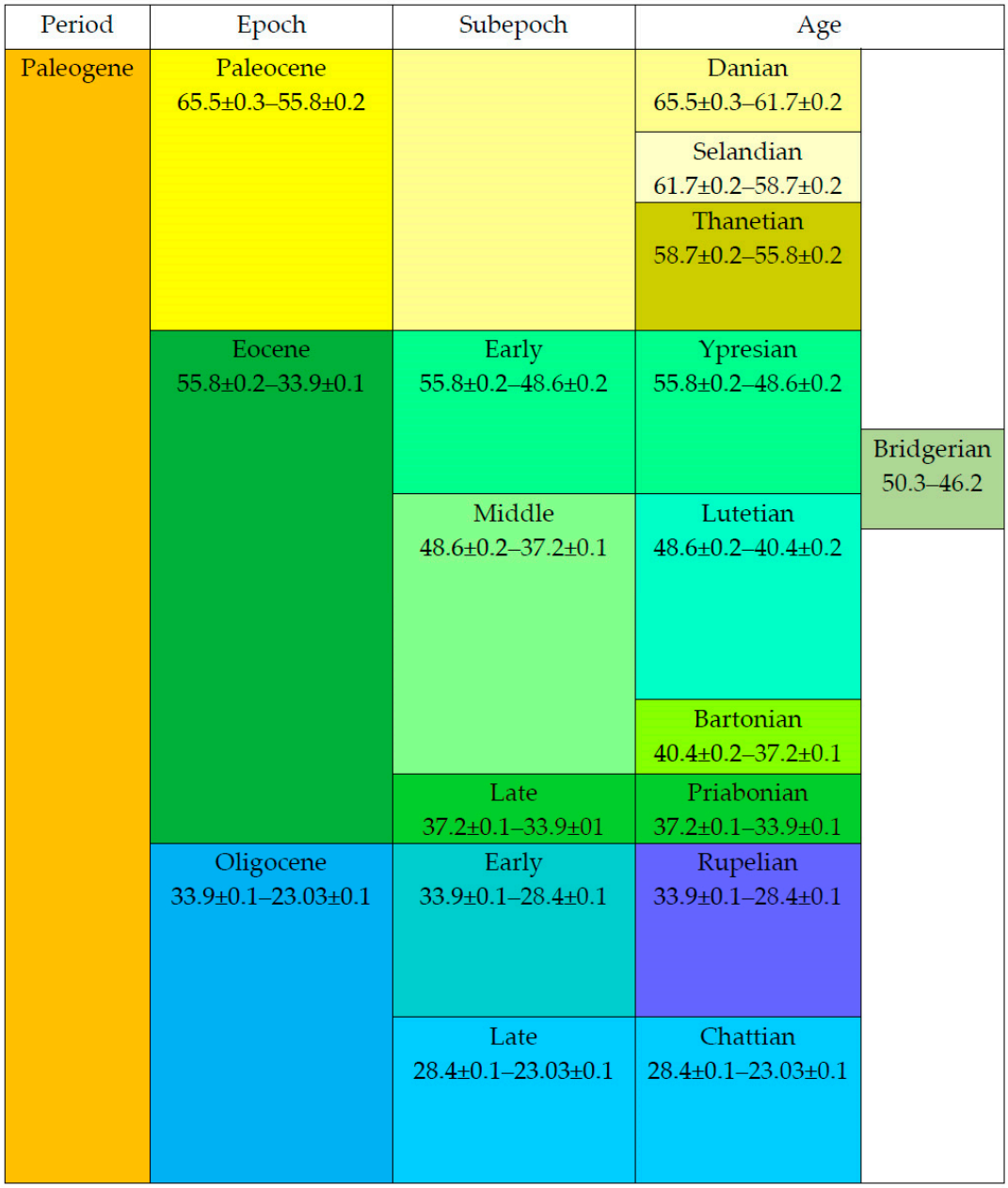

Figure 1. Geochronology of the Paleogene (Ma).

Curculionoidea have been found from 53 localities in 18 countries (Figure 2, Figure 3, Figure 4, Figure 5, Figure 6, Figure 9, Figure 12, Figure 14, Figure 20, Figure 21), spanning all ages of the Paleogene (Table 1).

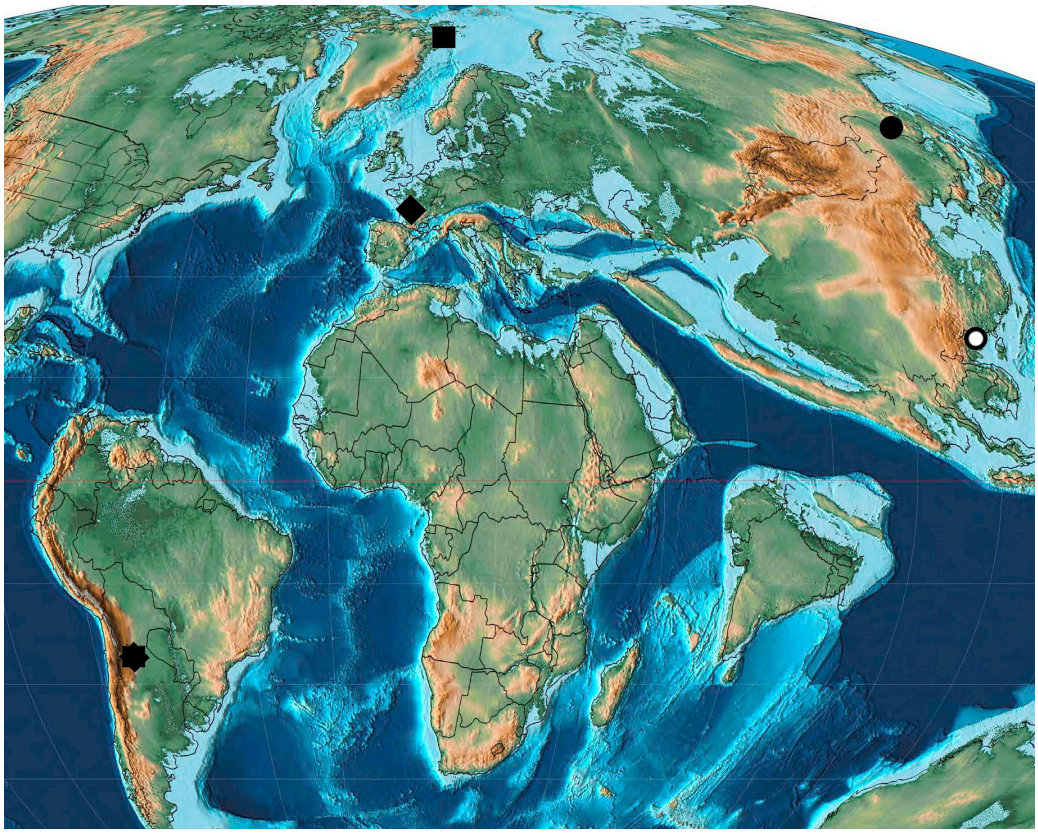

Figure 2. Paleocene Curculionoidea deposits: octagon—Sunchal; square—Starostin; rhombus—Menat; circle—Arkhara; ring—Mirs Bay.

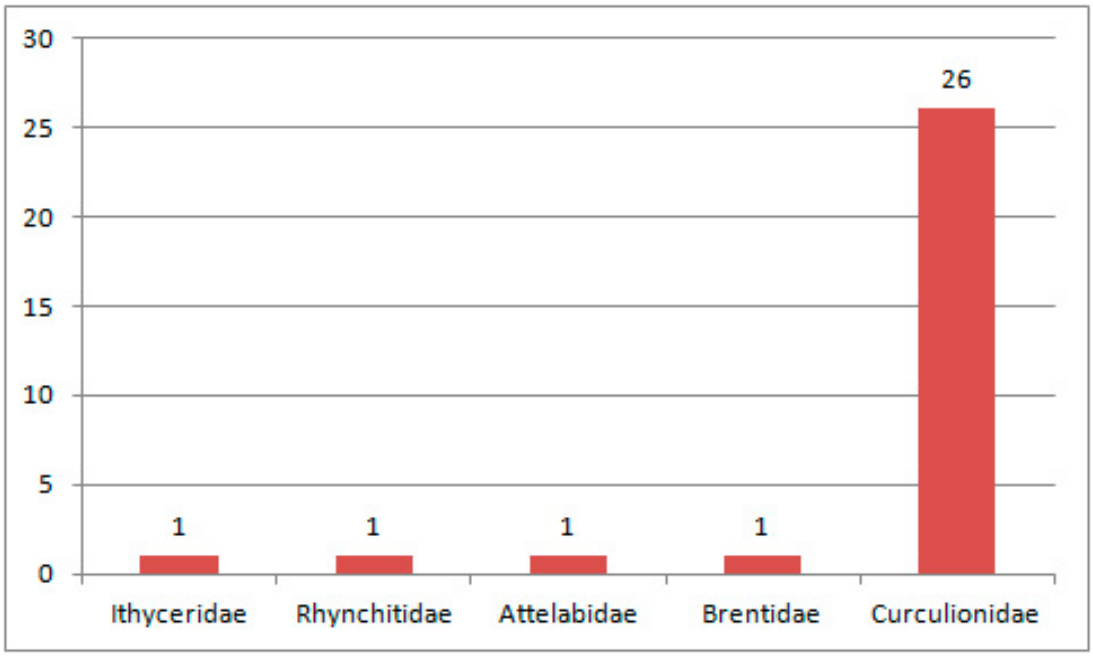

Figure 3. Composition of species of Curculionoidea in the Paleocene fauna.

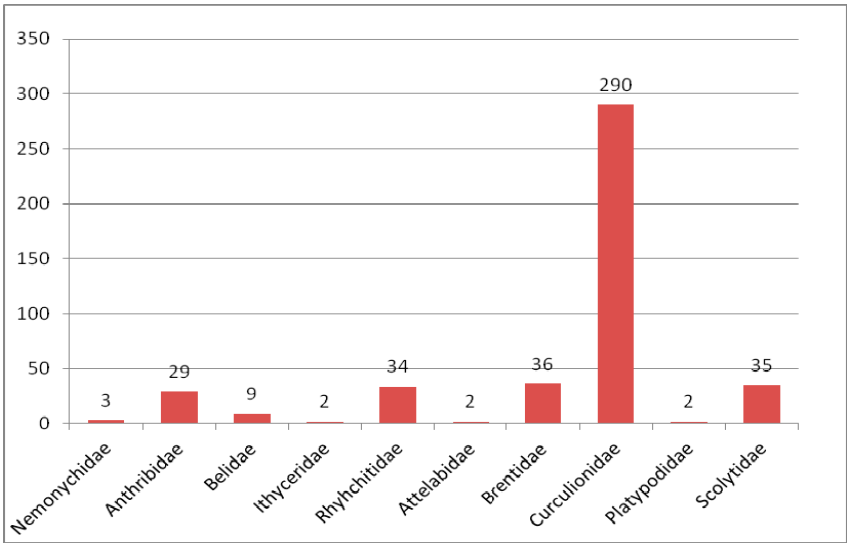

Figure 4. Composition of species of Curculionoidea in the Eocene fauna.

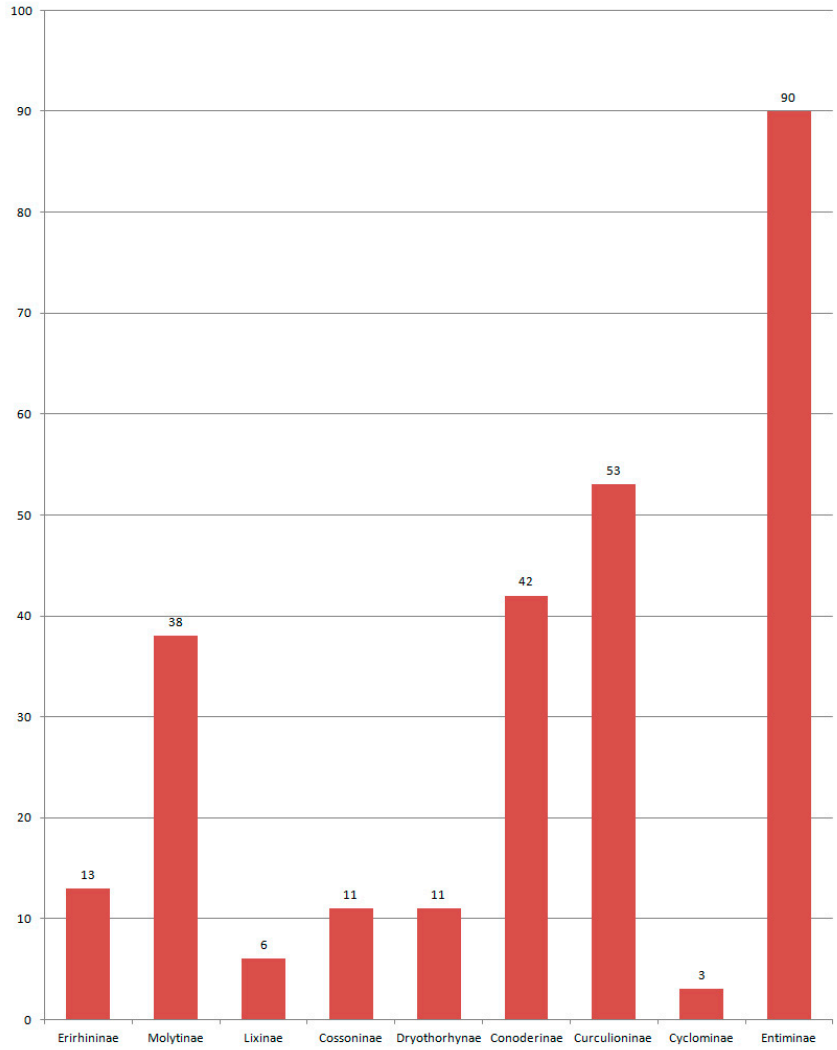

Figure 5. Composition of species of Curculionidae in the Eocene fauna.

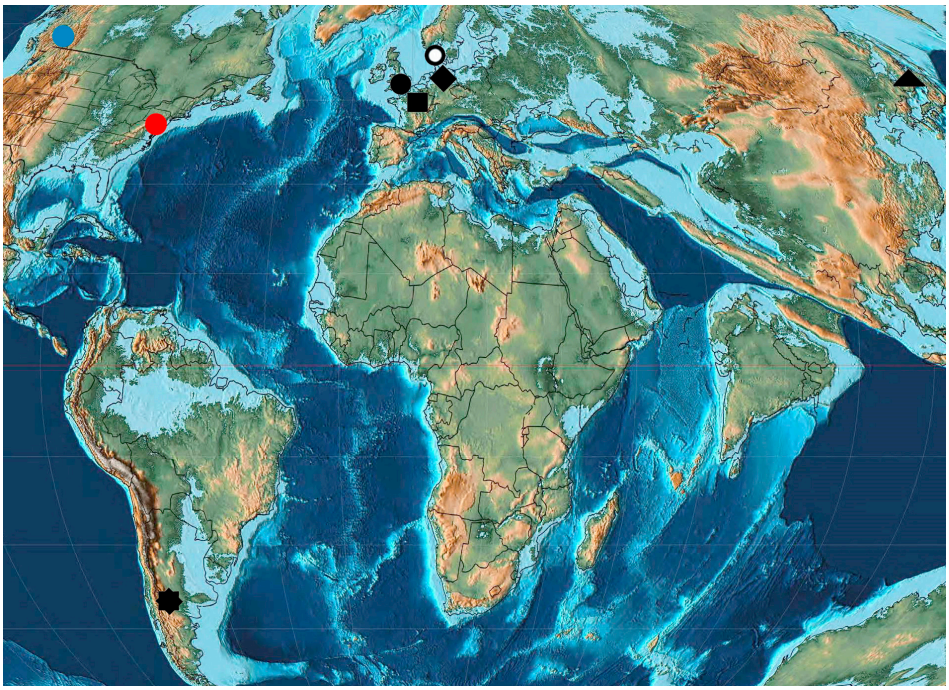

Figure 6. Early Eocene Curculionoidea deposits: square—Oise amber; circle—Peckham and London Clay; rhombus—Havighorst; ring—Mors; red circle—Republic; blue circle—Quilchena; triangle—Tadushi; octagon—Huitrera Formation.

Table 1. Localities with Curculionoidea from the Paleogene.

Name	Abbreviation	Location	Age
Arkhara	**Arkh (P1d)**	Russia: Amurskaya Region, Arkharinskii District, quarry at Arkhara Railway Station	Lower Paleocene, Danian, Cagayan
Starostin	**Star (P1d)**	Norway: Spitsbergen, Svalbard and Jan Mayen, Firkanten Formation	Lower Paleocene, Danian, 63 ± 2 Ma
Sunchal	**Sunc (P1d)**	Argentina: northern Argentina, Jujuy Province, La Mendieta, Maiz Gordo Formation	Lower Paleocene, Danian, 66.0–55.8 Ma
Menat	**Mena (P1sl-t)**	France: Puy-de-Dome	Middle-Upper Paleocene, Selandian-Thanetian, 61.0–59.0 Ma
Mirs Bay	**Mirs (P1)**	China: Hong Kong, Peng Chau Island, gray sandy shales, Ping Chau Formation	Paleocene
Mors	**Mors (P2i)**	Denmark, Fur Formation	Lower Eocene, Ypresian, 54.0 Ma
London Clay	**LonC (P2i)**	United Kingdom: England: Sussex, Bognor Regis	Lower Eocene, Ypresian, 54.0–50.0 Ma
Roan Mountain	**RoaM (P2i-l)**	United States: Colorado, Green River Formation	Lower-Middle Eocene, Bridgerian, 53.5–48.5 Ma
Green River	**GreR (P2i-l)**	United States: Colorado, Wyoming, Utah States, 3–4 km west of railway crossing of Green River, Green-River Formation	Lower-Middle Eocene, Bridgerian, 53.5–48.5 Ma
Oise amber	**OisJ (P2i)**	France: Paris basin, Creil, Oise	Lowermost Eocene, Ypresian, 53.0 Ma

Table 1. *Cont.*

Name	Abbreviation	Location	Age
Huitrera Formation		Argentina: Arroyo Chacay, Río Negro, near Estancia Don Hipólito, W, about 60 km east from San Carlos de Bariloche, Huitrera Formation	Lower Eocene, Ypresian, 54.24 ± 0.45 Ma
Peckham	**Peck (P2i)**	England: South London, Reding Beds	Lower Eocene, Ypresian
Havighorst	**Havi (P2i)**	Germany: east of Hamburg, Schleswig Holstein	Lower Eocene, Ypresian
Quilchena		Canada: British Columbia, 3 km south of Nicola Lake, lacustrine shale	Lower Eocene, Ypresian, 51.5 ± 0.4 Ma
Republic	**Repu (P2i)**	United States: Northeast Washington State, Klondike Mountain Formation	Lower Eocene, Ypresian, 49.0–48.0 Ma
Tadushi	**Tadu (P2i)**	Russia: Russian Far East, Primorsky Krai, Kavalerovsky District, Pestrushka River near mouth and Ugol'nyi Creek, tributary of Zerkal'nyi (Tadushi) River, near village of Suvorovo, Tadushi Formation	Lower Eocene, Ypresian
Messel	**Mess (P2l)**	Germany: near Frankfurt, oil shales	Middle Eocene, Upper Ypresian Lower Lutetian, 48.27 ± 0.22–47.0 Ma
Corfe	**Corf (P2l)**	United Kingdom: England: Dorset, Corfe Clay, Lower Bagshot Beds	Middle Eocene, Lutetian,
Bournemouth	**Bour (P2l)**	United Kingdom: England, Dorset, Bagshot Series	Middle Eocene, Lutetian, 50.0–42.0 Ma
Geiseltal	**Geis (P2l)**	Germany: near Halle	Middle Eocene, Lutetian, 47.5–42.5 Ma
Eckfelder Maar	**Maar (P2l)**	Germany: Rheinland-Pfalz, Rhine Palatine	Middle Eocene, Lutetian, 44.3 Ma
Baltic amber (Kaliningrad region)	**BalJ (P2b)**	Russia: Kaliningrad Region, Baltic Sea coast and Amber Jantarnyi quarry near Kaliningrad, Prussian Formation	Middle Eocene, Bartonian, 48.0–33.0 Ma
Polish amber	**PolJ (P2b)**	Poland: Gdansk city area, at the Wisla River Estuary, Baltic amber, Prussian Formation;	Middle Eocene, Bartonian, 48.0–33.0 Ma
Scandinavian amber	**ScanJ (P2b)**	Denmark, amber deposits on the Danish coast, Baltic amber, Prussian Formation	Middle Eocene, Bartonian, 48.0–33.0 Ma
Rovno amber	**RovJ (P2b)**	Ukraine: Rovno Region, Klesov and Dubrovice quarries	Middle Eocene, Bartonian, 48.0–33.0 Ma
Bitterfeld amber		Germany: Saxony-Anhalt, Goitzsche near Bitterfeld	Middle Eocene, Bartonian, 48.0–33.0 Ma
Romanian amber		Romania: Alunisului Hill, Valea Sibiciului, Colti	Middle Eocene, Bartonian, 48.0–33.0 Ma
Kutschlin	**Kuts (P2b)**	Czech Republic, northwest Bohemia, near Bilina	Middle Eocene, Bartonian
Celas	**Cela (P2p)**	France: Gard Department, railway Uze's–Saint-Julien-de-Casig-nac, Fumades, Corents, Bassein Ales	Upper Eocene, Priabonian

Table 1. *Cont.*

Name	Abbreviation	Location	Age
Ales-Monteils	**Ales (P2p)**	France: Gard	Upper Eocene, Priabonian
Florissant	**Flor (P2p)**	United States: Colorado, Rocky Mountains near Pike's Peak, Florissant Formation	Latest Eocene, Priabonian, 34.07 ± 0.10 Ma
Biamo	**Biam (P2p)**	Russia: Russian Far East, Primorsky Region, Pozharskii District, source of Barachek Creek, right tributary of Bol'shaya Svetlovodnaya (formerly Biamo) River	Upper Eocene, Priabonian
Fonseca	**Fons (P2p)**	Brazil: Minas Gerais State, near Fonseca municipality, Whitish shales, under bituminous shales, Fonseca Basin, Fonseca Formation	Oligocene, Priabonian
White River Badlands	**WhiR (P3r)**	United States: South Dakota	Lower Oligocene, Rupelian, 34.0–31.2 Ma
Brunnstatt	**Brun (P3r)**	France: Alsace, Haut-Rhine Dept., 5 km southwest of Mulhouse	Lower Oligocene, Rupelian, 33.9 Ma
Corent	**Core (P3r)**	France: South France, Puy-de-Dom Department, Gergovia Plateau, south of Clermon-Ferran	Lower Oligocene, Rupelian
Cereste		France: Alpes-de-Haute Province, Basses Alp Department	Lower Oligocene, Rupelian
Seifhennersdorf		Germany: Saxony, Oberlausitz	Lower Oligocene, Rupelian, 30.5–30.2 Ma
Ahuehuetes		Mexico: Puebla, 4.5 km NNE from Tepexi de Rodrigues, Los Ahuehuetes, Coatzingo Formation	Lower Oligocene, Rupelian
Kundratice		Czech Republic: near Litomioice and Seifhennersdorf	Lower Oligocene, Rupelian
Sieblos	**Sieb (P3)**	Germany: Hessen, Rhon	Middle Oligocene
Kleinkembs	**Klei (P3)**	Germany: Baden-Wurtemberg, 10 km northwest of Lorrach, Pays de Bade, Salt Formation	Middle Oligocene
Gaube	**Gaub (P3)**	France: Puy-de-Dome, ravin de la Gaube	Lower Oligocene, Rupelian
Puy-Saint-Jean	**PuStJ (P3)**	France: Puy-de-St. Jean	Middle Oligocene
Luzice	**Luzi (P3h)**	Czech Republic: northwest Bohemia	Upper Oligocene, Chattian
Enspel		Germany: Rheinland-Pfalz, Westerwald, Bad Marienberg	Upper Oligocene, Chattian, 24.79 – 24.56 Ma
Ashutas		Kazakhstan: East Kazakhstan Region, Kurshim District, right bank of River Cherny Irtysh	Upper Oligocene, Chattian
Perekishkyul'		Azerbaijan: middle course of Sumgait River, village of Perekeshkul, Maikop Formation	Upper Oligocene, Chattian
Rott	**Rott (P3h)**	Germany: North Rhine-Westfalia, Siebengebirge, near Bonn, Rott Formation	Latest Oligocene, Upper Chattian, 24.0–23.0 Ma
Aix-en-Provance	**Aix (P3h)**	France: Bouches-du-Rhane, Aix-en-Provence Formation	Latest Oligocene, Upper Chattian
Kap Dalton	**KapD (P3)**	Denmark: Greenland	Oligocene
Kenderlyk II		Kazakhstan: East Kazakhstan Region, Zaisan district, left bank of Kenderlyk River, 6 km from village of Kenderlyk	Oligocene

Maps for Paleogene localities were from Scotese [1].

The ages of fossil deposits used are from the website Fossilworks—http://fossilworks.org and some publications [2–21]. Baltic amber from the Prussian Formation ranges from 33–48 million years (Lutetian-Bartonian) [22] and in this work the Bartonian age is accepted [23].

The systematics of the superfamily Curculionoidea is currently not stable [24–30]. Previously, it included the Mesozoic family Obrieniidae, the systematic position of which is assumed to be related to the Curculionoidea [31] or considered as a family within the Archostemata [32] or a separate superfamily within the Curculioniformia [30,33] and is not considered in this paper. The number of families, groups related to these families and their taxonomic status are not universally accepted [24–30,34–36]. Also the families Nemonychidae, Anthribidae, Belidae, Ithyceridae, Brentidae, Curculionidae, Platypodidae and Scolytidae not universally accepted. In this work the higher classification proposed by the author [29,30,37–42] is adopted. The subfamily Cimberidinae is considered part of the family Nemonychidae [26,29,37,38,43], in contrast to the opinion of Seunggwan et al. [44]. The families Anthribidae and Belidae are accepted in the traditional composition [25,27,29,30,32,38,45]. Ithyceridae and Caridae are often regarded as unrelated groups [25–28,32,36,44]; however, the author considers the family Ithyceridae (incl. Caridae and Ulyanidae) as a diverse, predominantly extinct group, including five fossil (Mongolocarinae, Baissorhynchinae, Montsecanomalinae, Ulyaninae, Slonikinae) and three recent subfamilies (Carinae, Chilecarinae, Ithycerinae) [29,30,38,46–51]. Rhynchitidae and Attelabidae are considered as independent families [30,38,52–61]. The family Brentidae consists of six subfamilies [38]. Nanophyinae and Apioninae, sometimes considered as separate families [26,62–64], are included in Brentidae [25,27,30,32,36,38]. The family Curculionidae includes Erirhininae according to Zherikhin and Egorov [65] and Legalov [30,41]. Scolytidae and Platypodidae are considered as separate families [29,30,34,66].

Many Paleogene species were described in the 19th - first half of the 20th century in modern genera. The descriptions and illustrations of Many have been re-studied. If the generic affiliation was in doubt, then the genus has been placed in quotes. The results of these studies were presented by Legalov [30,47,50,67–71].

The studied fossil forms are deposited in—A. Bukejs's collection, Daugavpils, Latvia; A. Górski's collection, Bielsko-Biala, Poland; Borissiak Paleontological Institute of the Russian Academy of Sciences, Moscow, Russia; C. Gröhn's collection (Glinde, Germany) deposited in the Center of Natural History (formerly Geological–Paleontological Institute and Museum), Hamburg, Germany; Center of Natural History (formerly Geological–Paleontological Institute and Museum), Hamburg, Germany; Centre de Conservation du musée des confluences, Lyon, France; Earth Institute, Warsaw, Poland; F. Kernegger's collection, Hamburg, Germany, deposited in the Forschungsinstitut Senckenberg, Frankfurt am Main, Germany; Friedhelm Eichmann, Hannover, Germany; Górnośląskie Muzeum Przyrodnicze w Bytomiu, Poland; Kaliningrad Regional Amber Museum, Kaliningrad, Russia; Legalov's fossil insects collection Maintained at Institute of Systematics and Ecology of Animals of the Siberian Branch of the Russian Academy of Science, Novosibirsk, Russia; Muséum national d'histoire naturelle, Paris, France; Museum of Amber Inclusions, University of Gdańsk, Poland; Museum of the World Ocean, Kaliningrad, Russia; Naturhistorisches Museum Mainz, Landessammlung für Naturkunde Rheinland-Pfalz; Poinar amber collection Maintained at Oregon State University, Corvallis, OR, USA; Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine, Kiev, Ukraine; V. Alekseev's collection, Kaliningrad, Russia; V. Gusakov's collection, Russia, Moscow; Zoological Museum, University of Copenhagen, Denmark.

The specimens were studied using a stereomicroscope Zeiss Stemi 2000-C in the Institute of Systematic and Ecology of Animals (Novosibirsk, a Leica M165C binocular microscope, with Leica DFG 425, MBS 10, MBS 12 in the Paleontological Institute (Moscow), a Leica MZ 16.0 stereomicroscope with a DFC290 camera in the Zoological Institute (St. Petersburg) and an Olympus SCX9 stereomicroscope with an Olympus camera and a Nikon SMZ1500 with Microscope Eyepiece Camera 9.0MP Aptina Color CMOS MU900 in the Muséum National d'Histoire Naturelle (Paris).

The present work is registered in ZooBank (www.zoobank.org) under LSID urn—lsid:zoobank.org:pub:125CCA9E-7288-4C12-88C9-BDEBDC300A9C.

3. Results

Four species of the family Nemonychidae, 33 species of the family Anthribidae, three species of the family Ithyceridae, nine species of the family Belidae, 41 species of the family Rhynchitidae, three species of the family Attelabidae, 47 species of the family Brentidae, 384 species of the family Curculionidae, two species of the family Platypodidae and 37 species of the family Scolytidae were described from the Paleogene (Table 2).

Table 2. List of species of Curculionoidea from Paleogene [8,29,30,47,50,67,69–175].

No.	Taxon	Locality	Age	Sources
	Nemonychidae Bedel, 1882 Cretonemonychinae Gratshev et Legalov, 2009 Eocaenonemonychini Legalov, 2013			
1	*Eocaenonemonyx kuscheli* Legalov, 2013	GreR	P2i-l	72
2	"*Sitones*" *grandaevus* Scudder, 1876	GreR	P2i-l	73
3	"*Eugnamptus*" *decemsatus* Scudder, 1878	KapD	P3	74
	Cimberidinae Gozis, 1882 Kuschelomacerini Riedel, 2010			
4	*Kuschelomacer kerneggeri* Riedel, 2010	BalJ	P2b	75
	Anthribidae Billberg, 1820 Anthribinae Billberg, 1820 Cratoparini LeConte, 1876			
5	"*Euparius*" *elusus* (Scudder, 1878)	GreR	P2i-l	74
6	"*E.*" *repertus* (Scudder, 1878)	Flor	P2p	74
7	"*E.*" *adumbratus* (Wickham, 1911)	Flor	P2p	76
8	"*E.*" *arcessitus* (Scudder, 1893)	Flor	P2p	77
	Anthribini Billberg, 1820			
9	"*Ormiscus*" *partitus* (Scudder, 1890)	GreR	P2i-l	78
10	"*Trigonorhinus*" *pristinus* (Scudder, 1876)	GreR	P2i-l	73
11	"*T.*" *sordidus* (Scudder, 1893)	Flor	P2p	77
	Ecelonerini Lacordaire, 1865			
12	*Pseudochirotenon eocaenicus* Legalov, 2018	GreR	P2i-l	69
13	*Saperdirhynchus prisctitillator* Scudder, 1893	Flor	P2p	77
	Mecocerini Lacordaire, 1865			
14	*Pseudoecocerus aleksevi* Legalov, 2020	BalJ	P2b	71
	Tropiderini Lacordaire, 1865			
15	"*Tropideres*" *remotus* Scudder, 1893	GreR	P2i-l	77
16	"*T.*" *vastats* Scudder, 1893	Flor	P2p	77
	Allandrini Pierce, 1930			
17	*Pseudomecorhis orlovi* Zherikhin, 1971	BalJ	P2b	79
18	*P. simulator* Voss, 1953	BalJ	P2b	80
19	*Allandroides vossi* Legalov, 2015	BalJ	P2b	30
	Oiserhinini Legalov, Kirejtshuk et Nel, 2019			
20	*Oiserhinus insolitus* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
	Zygaenodini Lacordaire, 1865			
21	*Glaesotropis* (*Pseudoglaesotropis*) *balticus* Legalov, 2020	BalJ	P2b	71

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
22	*G.* (*P.*) *martynovi* (Legalov, 2012)	BalJ	P2b	82
23	*G.* (*Glaesotropis*) *diadiasashai* Gratshev et Perkovsky, 2008	RovJ	P2b	83
24	*G.* (*G.*) *gusakovi* Legalov, 2015	BalJ	P2b	30
25	*G.* (*G.*) *minor* Gratshev et Zherikhin, 1995	BalJ	P2b	84
26	*G.* (*G.*) *succiniferus* Legalov, 2015	BalJ	P2b	30
27	*G.* (*G.*) *weitschati* Gratshev et Zherikhin, 1995	BalJ	P2b	84
28	*G.* (*Electranthribus*) *alleni* Legalov, 2015	BalJ	P2b	30
29	*G.* (*E.*) *gratshevi* Legalov, 2015	BalJ	P2b	30
30	*G.* (*E.*) *zherikhini* (Legalov, 2013)	BalJ	P2b	47
	Tribe incertae sedis			
31	*Stiraderes conradi* Scudder, 1893	Flor	P2p	77
	Choraginae W. Kirby, 1819 Choragini W. Kirby, 1819			
32	"*Choragus*" *fictilis* Scudder, 1890	GreR	P2i-l	78
33	"*Ch.*" *tertiarius* Heyden et Heyden, 1866	Rott	P3h	85
	Valenfriesiini Alonso-Zarazaga et Lyal, 1999			
34	*Eduardoxenus unicus* Legalov, Nazarenko et Perkovsky, 2018	RovJ	P2b	86
	Urodontinae C.G Thomson, 1859			
35	"*Bruchela*" *cincta* (Foerster, 1891)	Brun	P3r	87
36	"*B.*" *priscus* (C. Heyden, 1862)	Rott	P3h	88
37	"*B.*" *multipunctata* (Schlechtendal, 1894)	Rott	P3h	89
	Ithyceridae Schoenherr, 1823 Chilecarinae Legalov, 2009 Chilecarini Legalov, 2009			
38	*Petropsis rostratus* Legalov, Kirejtshuk et Nel, 2017	Mena	P1sl-t	50
	Ithycerinae Schoenherr, 1823			
39	*Eoceneithycerus carpenteri* Legalov, 2013	Repu	P2i	47
40	*Ithyceroides klondikensis* Legalov, 2015	Repu	P2i	30
	Belidae Schoenherr, 1826 Oxycoryninae Schoenherr, 1840 Oxycraspedini Marvaldi et Oberprieler, 2006			
41	*Oxycraspedus poinari* Legalov, 2016	BalJ	P2b	90
	Metrioxenini Voss, 1953 Metrioxenina Voss, 1953			
42	*Archimetrioxena electrica* Voss, 1953	BalJ	P2b	80
43	*A. zherikhini* (Legalov, 2012)	BalJ	P2b	82
	Zherichinixenina Legalov, 2009			
44	*Paltorhynchus bisculcatus* Scudder, 1893	RoaM	P2i-l	77
45	*P. narwhal* Scudder, 1893	Flor	P2p	77
46	*Succinometrioxena attenuata* Legalov et Poinar, 2020	BalJ	P2b	91
47	*S. bachofeni* Legalov, 2013	BalJ	P2b	47
48	*S. poinari* Legalov, 2012	BalJ	P2b	92
	Allocorynitae Sharp, 1890 Palaeorhopalotriini Legalov, 2013			
49	*Palaeorhopalotria neli* Legalov, 2013	Ales	P2p	47
	Rhynchitidae Gistel, 1856 Sayrevilleinae Legalov, 2003 Sanyrevilleini Legalov, 2003			

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
50	*Baltocar convexus* Legalov, 2015	BalJ	P2b	30
51	*B. groehni* Riedel, 2012	BalJ	P2b	93
52	*B. hoffeinsorum* Riedel, 2012	BalJ	P2b	93
53	*B. subnudus* Riedel, 2012	BalJ	P2b	93
54	*B. succinicus* (Voss, 1953)	BalJ	P2b	80
	Vossicartini Legalov, 2003			
55	*Germanocartus heydeni* (Schlechtendal, 1894)	Rott	P3h	89
	Rhynchitinae Gistel, 1856 Auletini Desbrochers des Loges, 1908 Auletina Desbrochers des Loges, 1908			
56	*Electrauletes unicus* Legalov, 2015	BalJ	P2b	30
	Pseudauletina Voss, 1933			
57	*Eoropseudauletes plucinskii* Kania et Legalov, 2019	BalJ	P2b	94
	Pseudomesauletina Legalov, 2003			
58	*Pseudomesauletes groehni* Bukejs et Legalov, 2019	RovJ	P2b	95
59	*P. culex* (Scudder, 1893)	Flor	P2p	77
60	*P. ibis* (Wickham, 1912)	Flor	P2p	96
61	*P. obliquus* (Wickham, 1913)	Flor	P2p	97
62	*P. striaticeps* (Wickham, 1911)	Flor	P2p	76
	Subtribe incertae sedis			
63	"*Teretrum*" *quiescitum* Scudder, 1893	GreR	P2i-l	77
64	*T. primulum* Scudder, 1893	Flor	P2p	77
65	*Docirhynchus terebrans* Scudder, 1893	Flor	P2p	77
66	"*Trypanorhynchus*" *depratus* Scudder, 1893	Flor	P2p	77
67	"*Paltorhynchus*" *rectirostris* Scudder, 1893	Flor	P2p	77
68	"*Trypanorhynchus*" *sedatus* Scudder, 1893	Flor	P2p	77
	Rhynchitini Gistel, 1856 Temnocerina Legalov, 2003			
69	*Eocenorhynchites vossi* Legalov, 2012	BalJ	P2b	74
	Perrhynchitina Legalov, 2003			
70	*Succinorhynchites alberti* Legalov, 2013	BalJ	P2b	47
71	*Tatianaerhynchites goergesi* (Zherikhin, 1992)	Rott	P3h	98
	Rhynchitina Gistel, 1856			
72	*Cartorhynchites struvei* Zherikhin, 1992	Rott	P3h	98
73	*Opacoinvolvulus rottensis* (Zherikhin, 1992)	Rott	P3h	98
74	*O. zherichini* Legalov, 2003	Rott	P3h	55
	Subtribe incertae sedis			
75	"*Rhysosternum*" *punctatolineatum* Piton, 1940	Mena	P1sl-t	99
76	*Isothea alleni* Scudder, 1893	Flor	P2p	77
	=*Trypanorhynchus corruptivus* Scudder, 1893			77
77	*Prodeporaus curiosum* (Scudder, 1893)	Flor	P2p	77
78	*P. exanimale* (Scudder, 1893)	Flor	P2p	77
79	*P. exilis* (Wickham, 1913)	Flor	P2p	97
80	*P. minutissimus* (Wickham, 1913)	Flor	P2p	97
81	*P. smithii* (Scudder, 1893)	Flor	P2p	77
82	"*Prodeporaides*" *laminarum* (Wickham, 1916)	Flor	P2p	100
83	"*P.*" *subterraneus* (Scudder, 1893)	Flor	P2p	77
84	"*P.*" *vulcan* (Wickham, 1916)	Flor	P2p	100
85	*P. wymani* (Scudder, 1893)	Flor	P2p	77
86	"*Masteutes*" *saxifer* Scudder, 1893	Flor	P2p	77
87	"*Rhynchites*" *hageni* Heyden et Heyden, 1866	Rott	P3h	85

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Eugnamptini Voss, 1930			
88	"*Eugnamptidea*" *florissantensis* Wickham, 1913	Flor	P2p	97
89	*E. robusta* Wickham, 1916	Flor	P2p	100
90	*E. tertiaria* Wickham, 1912	Flor	P2p	101
	Attelabidae Billberg, 1820 Attelabinae Billberg, 1820 Attelabitae Billberg, 1820 Euscelini Voss, 1925 Clinolabina Legalov, 2003			
91	*Paleoclinolabus dormitus* (Scudder, 1893)	Flor	P2p	77
	Attelabini Billberg, 1820			
92	"*Phytonomus*" *punctatus* Piton, 1940	Mena	P1sl-t	99
93	*Palaeoalatorostrum schaali* Rheinheimer, 2007	Mess	P2l	102
	Brentidae Billberg, 1820 Apioninae Schoenherr, 1823 Tanaitae Schoenherr, 1839 Tanaini Schoenherr, 1839			
94	*Cretotanaos bontsaganensis* Legalov, 2014	Tadu	P2i	103
	Rhadinocybitae Alonso-Zarazaga, 1992 Rhadinocybini Alonso-Zarazaga, 1992			
95	*Baltocyba electrinus* Legalov, 2018	PolJ	P2b	104
	Notapionini Zimmerman, 1994			
96	*Archinvolvulus liquidus* Voss, 1972	ScanJ	P2b	105
	Palaeotanaitae Kirejtshuk, Legalov et Nel, 2015 Palaeotanaini Kirejtshuk, Legalov et Nel, 2015			
97	*Palaeotanaos oisensis* Kirejtshuk, Legalov et Nel, 2015	OisJ	P2i	8
	Aspidapiitae Alonso-Zarazaga, 1990 Aspidapiini Alonso-Zarazaga, 1990			
98	*Pseudaspidapion khnzoriani* (Zherikhin, 1971)	BalJ	P2b	79
99	*Baltoapion gusakovi* (Legalov, 2015)	BalJ	P2b	30
100	*B. subdiscedens* (Voss, 1953)	BalJ	P2b	80
	Kalcapiini Alonso-Zarazaga, 1990			
101	*Melanapion* (*Melanapionoides*) *poinari* Legalov, 2015	BalJ	P2b	30
102	*M.* (*M.*) *wanati* Legalov, 2012	BalJ	P2b	67
103	*Succinapion telnovi* Legalov et Bukejs, 2014	BalJ	P2b	106
	Apionitae Schoenherr, 1823 Piezotrachelini Voss, 1959			
104	*Conapium alleni* Legalov, 2012	BalJ	P2b	67
105	*Baltoconapium anderseni* (Voss, 1972)	ScanJ	P2b	105
106	*Electrapion kuntzeni* (Wagner, 1924)	BalJ	P2b	107
	Aplemonini Kissinger, 1968			
107	*Perapion menatensis* Legalov, Kirejtshuk et Nel, 2017	Mena	P1sl-t	50
108	*P. rasnitsyni* Legalov, 2018	GreR	P2i-l	69
109	"*P.*" *profundum* (Schlechtendal, 1894)	Rott	P3h	89
	Apionini Schoenherr, 1823 Toxorhynchina Scudder, 1893			

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
110	*Apionion evestigatum* (Scudder, 1893)	RoaM	P2i-l	77
111	*Toxorhynchus europeoeocenicus* Bukejs et Legalov, 2020	RovJ	P2b	108
112	*T. michalskii* Legalov, in print.	PolJ	P2b	109
113	"*T.*" *arctus* (Scudder, 1893)	Flor	P2p	77
114	"*T.*" *confectum* (Scudder, 1893)	Flor	P2p	77
115	"*T.*" *corruptus* (Scudder, 1893)	Flor	P2p	77
116	*T. florissantensis* (Wickham, 1916)	Flor	P2p	100
117	*T. minusculus* (Scudder, 1893	Flor	P2p	77
118	*T. oculatus* (Scudder, 1893	Flor	P2p	77
119	"*T.*" *pumilum* (Scudder, 1893)	Flor	P2p	77
120	"*T.*" *refrenatum* (Scudder, 1893)	Flor	P2p	77
121	"*T.*" *reventus* (Scudder, 1893)	Flor	P2p	77
122	*T. scudderianum* (Wickham, 1916)	Flor	P2p	100
	Tribe incertae sedis			
123	"*Apion*" *cockerelli* Wickham, 1911	Flor	P2p	76
124	"*A.*" *obtusus* (Scudder, 1893)	Flor	P2p	77
125	"*A.*" *levirostre* Foerster, 1891	Brun	P3r	87
126	"*A.*" *parvum* Foerster, 1891	Brun	P3r	87
127	"*A.*" *sulcatum* Foerster, 1891	Brun	P3r	87
128	"*Rhynchites*" *orcinus* Heyden et Heyden, 1866	Rott	P3h	85
129	"*Apion*" *primordiale* Heyden et Heyden, 1866	Rott	P3h	85
130	"*A.*" *profundum* Schlechtendal, 1894	Rott	P3h	89
131	"*Coeliodes*" *primigenius* Oustalet, 1874	Aix	P3h	110
	Nanophyinae Gistel, 1856 Nanophyini Gistel, 1856			
132	*Palaeonanophyes zherikhini* Legalov, 2015	GreR	P2i-l	111
133	*Baltonanophyes crassirostre* Legalov, 2018	PolJ	P2b	104
134	*Zherikhiniellus rarus* Legalov, in print.	BalJ	P2b	109
135	"*Nanophyes*" *japetus* Heyden et Heyden, 1866	Rott	P3h	85
	Corimaliini Alonso-Zarazaga, 1989			
136	"*Corimalia*" *cycloptera* Theobald, 1937	Cela	P2p	112
	Brentinae Billberg, 1820 Trachelizini Lacordaire, 1865 Stereodermina Sharp, 1895			
137	*Cerobates* (*Cerobates*) *eocenicus* Legalov et Wappler, in print.	Maar	P2l	113
	Trachelizina Lacordaire, 1865			
138	*Eckfelderolispa petrefacta* Legalov et Wappler, in print.	Maar	P2l	113
139	*E. perita* Legalov et Wappler, in print.	Maar	P2l	113
140	*E. manderschieta* Legalov et Wappler, in print.	Maar	P2l	113
	Curculionidae Latreille, 1802 Erirhininae Schoenherr, 1825 Erirhinini Schoenherr, 1825 Erirhinina Schoenherr, 1825			
141	*Erirhinites bognorensis* Britton, 1960	LonC	P2i	114
142	"*Procas*" *vinculatus* Scudder 1893	RoaM, WhiR	P2i-l, P3r	77
143	"*P.*" *verberatus* Scudder, 1893	Flor	P2p	77
144	"*Erycus*" *brevicollis* Scudder, 1893	Flor	P2p	77

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Dorytomini Bedel, 1886			
145	*Dorytomus bukejsi* Legalov, 2020	BalJ	P2b	71
146	*D. electrinus* Legalov, 2016	BalJ	P2b	90
147	*D. groehni* Bukejs et Legalov, 2019	BalJ	P2b	116
148	*D. korotyaevi* Legalov, 2020	BalJ	P2b	71
149	*D. nudus* Legalov, 2016	BalJ	P2b	115
150	*D. vlaskini* Legalov, Nazarenko et Perkovsky, 2019	RovJ	P2b	117
151	"*D.*" *coercitus* Scudder, 1893	Flor	P2p	77
152	"*D.*" *vulcanicus* Wickham, 1912	Flor	P2p	101
153	"*D.*" *williamsi* Scudder, 1893	Flor	P2p	77
	Bagoini C.G. Thomson, 1859			
154	"*Bagous*" *palintonus* Foerster, 1891	Brun	P3r	87
	Molytinae Schoenherr, 1823 Molytini Schoenherr, 1823 Hylobiina W. Kirby, 1837			
155	*Archaralites zherichini* Legalov, 2010	Arkh	P1d	118
156	*Furhylobius troesteri* Legalov, 2015	Mors	P2i	30
157	*Archaeoheilus packardii* (Scudder, 1893)	GreR	P2i-l	77
158	*A. provectus* (Scudder, 1876)	GreR	P2i-l	73
159	*A. scudderi* Legalov, 2018	GreR	P2i-l	69
160	*A. ovalis* Legalov, 2018	GreR	P2i-l	69
161	*A. deleticius* (Scudder, 1893)	WhiR	P3r	77
162	*A. lacoei* (Scudder, 1893)	Flor	P2p	77
163	"*Anisorhynchus*" *offosus* Oustalet, 1870	Core	P3r	119
164	"*Hylobius*" *antiquus* Heyden et Heyden, 1866	Rott	P3h	85
	Plinthini Lacordaire, 1863 Leiosomatina Reitter, 1913			
165	*Leiosoma klebsi* Legalov, 2016	BalJ	P2b	115
	Pissodini Gistel, 1856			
166	*Lithopissodes luschitzensis* Beier, 1952	Luzi	P3h	120
	Acicnemidini Lacordaire, 1865			
167	*Electrotribus henningseni* (Voss, 1972)	ScanJ, PolJ BalJ, PolJ	P2b	105
168	*E. theryi* Hustache, 1942		P2b	121
	=*Paleopissodes weigangae* Ulke, 1947			122
	=*Anchorthorrhinus incertus* Voss, 1953			80
	=*Isalcidodes Macellus* Voss, 1953	BalJ		80
169	*E. wolfschwenningerae* (Rheinheimer, 2007)	BalJ	P2b	102
170	*E. rarus* Legalov, 2020		P2b	71
	Magdalini Pascoe, 1870			
171	"*Magdalis*" *sedimentorum* Scudder, 1893	Flor	P2p	77
172	"*M.*" *moesta* Schlechtendal, 1894	Rott	P3h	89
173	"*M.*" *deucalionis* (Heyden et Heyden, 1866)	Rott	P3h	85
174	"*M.*" *protogenius* (Heyden et Heyden, 1866)	Rott	P3h	85
	Cleogonini Gistel, 1856			
175	*Rhysosternum aeternabile* Scudder, 1893	Flor	P2p	77
176	*Rh. longirostre* Scudder, 1893	Flor	P2p	77
177	"*Conotrachelus*" *florissantensis* Wickham, 1912	Flor	P2p	102

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Sciabregmini Legalov, Kirejtshuk et Nel, 2019			
178	*Sciabregma rugosa* Scudder, 1893	RoaM	P2i-l	77
179	*S. squamosa* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
180	*S. tenuicornis* Cockerell, 1921	GreR	P2i-l	123
	Camptorhinini Lacordaire, 1865			
181	*Camptorrhinites orarius* Britton, 1960	LonC	P2i	114
182	*Korystina gracilis* Britton, 1960	LonC	P2i	114
	Aedemonini Faust, 1898			
183	*Electrorhinus friedhelmi* Legalov, 2020	BalJ	P2b	71
	Cryptorhynchini Schoenherr, 1825 Cryptorhynchina Schoenherr, 1825			
184	*Taylorius litoralis* Britton, 1960	LonC	P2i	114
185	"*Cryptorhynchus*" *annosus* Scudder, 1876	GreR	P2i-l	73
186	"*C.*" *coloradensis* Wickham, 1912	Flor	P2p	102
187	"*C.*" *evinctus* Scudder, 1893	Flor	P2p	77
188	"*C.*" *falli* Wickham, 1912	Flor	P2p	102
189	"*C.*" *kerri* Scudder, 1893	Flor	P2p	77
190	"*C.*" *profusus* Scudder, 1893	Flor	P2p	77
191	*Oisecalles latosquamosus* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
192	*Cryptorrhynchites sculpturatus* Haupt, 1950	Geis	P2l	124
193	*Succinacalles uniqus* Zherikhin, 1971	BalJ	P2b	79
	Tylodina Lacordaire, 1865			
194	*Baltacalles triumurbium* Bukejs, Alekseev et Legalov, 2020	BalJ	P2b	125
195	"*Acalles*" *icarus* Heyden et Heyden, 1866	Rott	P3h	85
	Tribe incertae sedis			
196	*Lutago fetosus* Britton, 1960	LonC	P2i	114
197	*L. nanus* Britton, 1960	LonC	P2i	114
198	*Pissodites argillosus* Britton, 1960	LonC	P2i	114
199	"*Chalcodermus*" *kirschi* Deichmueller, 1881	Kuts	P2b	126
200	*Laccopygus nilesii* Scudder, 1893	Flor	P2p	77
201	*L. rhenanus* Meunier, 1924	Rott	P3h	127
202	"*Acalles*" *exhumatus* Wickham, 1913	Flor	P2p	97
203	"*Pissodes*" *planatus* Foerster, 1891	Brun	P3r	87
204	"*Hylobius*" *deletus* Oustalet, 1870	Core	P3r	119
205	"*Plinthus*" *redivivus* Oustalet, 1870	Core	P3r	119
206	"*Hylobius*" *morosus* Oustalet, 1874	Core	P3r	110
207	"*Molytes*" *hassencampi* Heyden, 1858	Sieb	P3	128
208	"*Pissodes*" *effossus* Heyden, 185	Sieb	P3	128
209	8 "*Hylobius*" *carbo* Oustalet, 1874	Aix	P3h	110
210	"*Plinthus*" *heerii* Oustalet, 1874	Aix	P3h	110
	Lixinae Schoenherr, 1823 Lixini Schoenherr, 1823			
212	*Lixus ligniticus* Piton, 1940	Mena	P1sl-t	99
213	"*Larinus*" *longirostris* Foerster, 1891	Brun	P3r	87
214	"*L.*" *bronni* Heyden et Heyden, 1866	Rott	P3h	85
	Cleonini Schoenherr, 1826			

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
215	*Eocleonus subjectus* Scudder, 1893	Flor	P2p	77
216	"*Cleonus*" *degenerates* Scudder, 1893	Flor	P2p	77
217	"*C.*" *estriatus* Wickham, 1912	Flor	P2p	102
218	"*C.*" *exterraneus* Scudder, 1893	Flor	P2p	77
219	"*C.*" *foersteri* Scudder, 1893	Flor	P2p	77
220	"*C.*" *primoris* Scudder, 1893	Flor	P2p	77
221	"*C.*" *rohweri* Wickham, 1911	Flor	P2p	76
222	"*C.*" *arvernensis* Oustalet, 1870	Core	P3r	119
223	"*C.*" *fouilhouxii* Oustalet, 1870	Core	P3r	119
	Dryophthorinae Schoenherr, 1825 Stromboscerini Lacordaire, 1865			
224	*Palaeodexipeus kirejtshuki* Legalov, 2016	BalJ	P2b	90
225	*Rovnoslonik damzeni* Legalov, Nazarenko et Perkovsky, 2019	RovJ	P2b	117
226	*Stenommatomorphus hexarthrus* Nazarenko, 2009	RovJ	P2b	129
	Dryophthorini Schoenherr, 1825			
227	*Rhinoporkus gratiosus* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
228	*Lithophthorus rugosicollis* Scudder, 1893	Flor	P2p	77
229	*Spodotribus terrulentus* Scudder, 1893	Flor	P2p	77
230	*Dryophthorus incertus* (Theobald, 1935)	Aix	P3h	130
	Sphenophorini Lacordaire, 1865 Sphenophorina Lacordaire, 1865			
231	"*Scyphophorus*" *fossionis* Scudder, 1893	Flor	P2p	77
232	*S. laevis* Scudder, 1893	Flor	P2p	77
233	"*S.*" *tertiarius* Wickham, 1911	Flor	P2p	76
234	*Oryctorhinus tenuirostris* Scudder, 1893	Flor	P2p	77
235	"*Sphenophorus*" *proluviosus* Heyden et Heyden, 1866	Rott	P3h	85
	Tribe incertae sedis			
236	*Hipporhinops sternbergi* Cockerell, 1926	Flor	P2p	131
	Cossoninae Schoenherr, 1825 Dryotribini LeConte, 1876			
237	*Ampharthropelma decipiens* Voss, 1972	ScanJ	P2b	105
238	*Caulophilus Martynovae* Legalov, Nazarenko et Perkovsky, 2019	RovJ	P2b	117
239	*C. rarus* Legalov, 2016	BalJ	P2b	115
240	*C. squamosus* Legalov, 2016	BalJ	P2b	115
241	*C. sucinopunctatus* (Kuska, 1992)	BalJ	P2b	132
242	*C. zherikhini* Nazarenko, Legalov et Perkovsky, 2011	RovJ	P2b	133
243	*Necrodryophthorus inquilinus* Voss, 1953	BalJ	P2b	80
244	*Synommatodes patruelis* (Voss, 1953)	BalJ	P2b	80
245	*Electrocossonus kirejtshuki* Legalov, 2020	BalJ	P2b	71
	Rhyncolini Gistel, 1856 Rhyncolina Gistel, 1856			
246	*Rhyncolus sitonifrons* Zherikhin, 1992	Rott	P3h	98
	Cossonini Schoenherr, 1825			
247	"*Cossonus*" *devoratus* Cockerell, 1925	Sunc	P1d	134
248	"*C.*" *rutus* Scudder, 1893	RoaM	P2i-l	77
249	"*C.*" *gabbii* Scudder, 1893	Flor	P2p	77
250	*C. robustus* Meunier, 1916	Aix	P3h	135

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Conoderinae Schoenherr, 1833 Bariditae Schoenherr, 1836 Apostasimerini Schoenherr, 1844 Coelonertina Casey, 1922			
251	*Geraeus diruptus* (Scudder, 1893)	GreR	P2i-l	77
252	*G. anvilis* Legalov, 2018	GreR	P2i-l	70
253	*G. fossilis* Legalov, 2018	GreR	P2i-l	70
254	*G. antediluviana* (Wickham, 1916)	Flor	P2p	100
255	*G. hoveyi* (Wickham, 1912)	Flor	P2p	101
256	*G. hypogaeus* (Wickham, 1916)	Flor	P2p	100
257	*G. matura* (Scudder, 1893)	Flor	P2p	77
258	*G. obnuptus* (Scudder, 1893)	Flor	P2p	77
259	*G. schucherti* (Wickham, 1912)	Flor	P2p	101
260	*G. vulcanicus* (Wickham, 1913)	Flor	P2p	97
261	*Lithogeraeus greenriverensis* Legalov, 2018	GreR	P2i-l	70
262	*L. circumscripta* (Scudder, 1893)	RoaM	P2i-l	77
263	*L. ancilla* (Scudder, 1893)	RoaM	P2i-l	77
264	*L. comminute* (Scudder, 1893)	WhiR	P3r	77
265	*L. damnata* (Scudder, 1893)	Flor	P2p	77
266	*L. cremastorhynchoides* (Wickham, 1913)	Flor	P2p	97
267	*L. florissantensis* (Wickham, 1913)	Flor	P2p	97
268	*L. nearctica* (Wickham, 1916)	Flor	P2p	100
269	*L. primalis* (Wickham, 1917)	Flor	P2p	136
270	*L. renovata* (Wickham, 1916)	Flor	P2p	100
271	*Nicentrus curvirostris* Legalov, 2018	GreR	P2i-l	70
272	*Steganus barrandei* Scudder, 1893	RoaM	P2i-l	77
273	*Miogeraeus recurrens* Wickham, 1916	Flor	P2p	100
274	"*Pachybaris*" *rudis* Wickham, 1912	Flor	P2p	96
	Baridini Schoenherr, 1836 Baridina Schoenherr, 1836			
275	"*Baris*" *palaeophilus* Cockerell, 1920	Bour	P2l	137
276	"*B.*" *divisa* Scudder, 1893	Flor	P2p	77
277	"*B.*" *harlani* Scudder, 1893	Flor	P2p	77
278	"*B.*" *imperfecta* Scudder, 1893	Flor	P2p	77
279	"*B.*" *naviculare* (Foerster, 1891)	Brun	P3r	87
280	*Catobaris coenosa* Scudder, 1893	Flor	P2p	77
	Eurhinina Lacordaire, 1865			
281	*Eurhinus occultus* Scudder, 1876	Flor	P2p	77
	Tribe incertae sedis			
282	"*Ceutorhynchus*" *clausus* Scudder, 1893	Flor	P2p	77
	Conoderintae Schoenherr, 1833 Conoderini Schoenherr, 1833			
283	*Jantarhinus compressus* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
	Palaeomallerini Legalov, 2018			
284	*Palaeomallerus longirostris* Legalov, 2018	GreR	P2i-l	70
	Ceutorhynchitae Gistel, 1848 Ceutorhynchini Gistel, 1848			

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
285	"*Ceutorhynchus*" *degravatus* Scudder, 1893	RoaM	P2i-l	77
286	"*C.*" *eocenicus* Cockerell, 1920	Peck	P2i	137
287	*C. alekseevi* Legalov, 2016	BalJ	P2b	115
288	*C. electrinus* Legalov, 2016	BalJ	P2b	115
289	*C. succinus* Legalov, 2013	BalJ	P2b	47
290	"*C.*" *blaisdelli* Wickham, 1916	Flor	P2p	100
291	"*C.*" *compactus* Scudder, 1893	Flor	P2p	77
292	"*C.*" *duratus* Scudder, 1893	Flor	P2p	77
293	"*C.*" *irvingi* (Scudder, 1893)	Flor	P2p	77
294	"*C.*" *fischeri* Foerster, 1891	Brun	P3r	87
295	"*C.*" *crassirostris* Foerster, 1891	Brun	P3r	87
296	"*C.*" *obliquus* Foerster, 1891	Brun	P3r	87
297	"*C.*" *funeratus* Heyden et Heyden, 1866	Rott	P3h	85
298	*Baltocoeliodes sontagae* Legalov et Bukejs, 2018	BalJ	P2b	138
	Cnemogonini Colonnelli, 1979			
299	"*Coeliodes*" *primotinus* Scudder, 1893	Flor	P2p	77
	Phytobiini Gistel, 1848			
300	"*Ceuthorrhynchus*"*miegi* Theobald, 1937	Klei	P3	112
	Curculioninae Latreille, 1802 Acalyptini C.G. Thomson, 1859			
301	*Jantaronosik nebulosus* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
	Ellescini C.G. Thomson, 1859			
302	*Succinostyphlus mroczkowskii* Kuska, 1996 =*Electrotribus erectosquamata* Rheinheimer, 2007	BalJ	P2b	139 122
303	*Pachytychius eocenicus* Legalov, 2016	BalJ	P2b	115
	Palaeoanoplini Legalov, in print.			
304	*Palaeoanoplus horridus* Legalov, in print.	BalJ	P2b	140
	Smicronychini Seidlitz, 1891			
305	"*Smicronyx*" *antiquus* Foerster, 1891	Brun	P3r	87
	Curculionini Latreille, 1802 Erganiina Pelsue et O'Brien, 2011			
306	*Pseudoergania perkovskyi* Legalov, 2019	BalJ	P2b	141
	Timolina Pelsue et O'Brien, 2011			
307	*Baltocurculio Manukyani* Legalov, 2020	BalJ	P2b	71
	Curculionina Latreille, 1802			
308	*Menatorhis elegans* (Piton, 1940)	Mena	P1sl-	99
309	*Curculio havighorstensis* Zherikhin, 1995	Havi	tP2i	142
310	*C. anicularis* (Scudder, 1893)	Flor	P2p	77
311	*C. curvirostris* (Scudder, 1893)	Flor	P2p	77
312	*C. duttoni* (Scudder, 1893)	Flor	P2p	77
313	*C. extinctus* (Wickham, 1912)	Flor	P2p	102
314	C. *femoratus* (Scudder, 1893)	Flor	P2p	77
315	*C. flexirostris* (Scudder, 1893)	Flor	P2p	77
316	*C. florissantensis* (Wickham, 1913)	Flor	P2p	97
317	*C. minusculoides* (Wickham, 1911)	Flor	P2p	76
318	*C. minusculus* (Scudder, 1893)	Flor	P2p	77
319	*C. restrictus* (Scudder, 1893)	Flor	P2p	77
320	"*C.*" *beeklyi* (Cockerell, 1918)	Flor	P2p	143
321	*Numitor claviger* Scudder, 1893	Flor	P2p	77

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Anthonomini C.G. Thomson, 1859			
322	"*Anthonomus*" *sunchalensis* Cockerell, 1925	Sunc	P1d	134
323	"*A.*" *soporus* Scudder, 1890	GreR, RoaM, WhiR	P2i-l	78
		GreR	P3r	
		Flor		
324	"*A.*" *revictus* Scudder, 1893	Flor	P2i-l	77
325	"*A.*" *concussus* Scudder, 1893	Flor	P2p	77
326	"*A.*" *debilatus* Scudder, 1893	Flor	P2p	77
327	"*A.*" *defossus* Scudder, 1893	Flor	P2p	77
328	"A." *evigilatus* Scudder, 1893	Flor	P2p	77
329	"*A.*" *primordius* Scudder, 1893	Flor	P2p	77
330	"*A.*" *rohweri* Wickham, 1912	Flor	P2p	96
331	*Coccotorus principalis* Scudder, 1893	Flor	P2p	77
332	"*C.*" *requiescens* Scudder, 1893	Flor	P2p	77
333	*Cremastorhynchus stabilis* Scudder, 1893		P2p	77
334	*Smicrorhynchus Macgeei* Scudder, 1893		P2p	77
	Eugnomini Lacordaire, 1863			
335	*Archaeoeugnomus balticus* Legalov, 2016	BalJ	P2b	115
336	*Anthonoeugnomus barsevskisi* Legalov, 2020	BalJ	P2b	71
337	*Mazurieugnomus pilosus* Legalov, 2020	BalJ	P2b	71
338	*Groehnius electrum* Bukejs et Legalov, 2019	BalJ	P2b	144
339	*G. parvum* Legalov, 2020	BalJ	P2b	71
	Rhamphini Rafinesque, 1815 Palaeorhamphina Legalov, 2016			
340	*Palaeorhamphus damzeni* Legalov, 2020	BalJ	P2b	71
341	*P. eichmanni* Legalov, 2020	BalJ	P2b	71
342	*P. primitivus* Legalov, 2016	BalJ	P2b	115
	Rhamphina Rafinesque, 1815			
343	*Orchestes tatjanae* Legalov, 2016	BalJ	P2b	115
344	"*O.*" *languidulus* Scudder, 1893	Flor	P2p	77
345	*Tachyerges hyperoche* Legalov et Poinar, 2020	PolJ	P2b	91
	Tychiini C.G. Thomson, 1859 Tychiina C.G. Thomson, 1859			
346	*Eocenesibinia prussica* Legalov, 2016	BalJ	P2b	115
347	"*Sibinia*" *whitneyi* (Scudder, 1893)	Flor	P2p	77
348	"*S.*" *melancholicus* (Oustalet, 1874)	Aix	P3h	110
349	"*Tychius*" *evolatus* Scudder, 1893	Flor	P2p	77
350	"*T.*" *ferox* Wickham, 1917	Flor	P2p	136
351	"*T.*" *secretus* Scudder, 1893	Flor	P2p	77
352	"*T.*" *latus* Foerster, 1891	Brun	P3r	87
353	"*T.*" *manderstjernai* Heyden et Heyden, 1866	Rott	P3h	85
354	*Macrorhoptus intutus* Scudder, 1893	Flor	P2p	77
	Camarotini Schoenherr, 1833 Prionomerina Lacordaire, 1863			
355	*Paleodontopus smirnovae* Legalov, 2020	BalJ	P2b	71
356	*Masteutes rupis* Scudder, 1893	Flor	P2p	77
	Curculioninae incertae sedis			
357	"*Centrinus*" *longipes* Piton, 1940	Mena	P1sl-t	99
358	"*Gymnetron*" *lecontei* Scudder, 1878	GreR	P2i-l	74
359	"*G.*" *antecurrens* Scudder, 1893	Flor RovJ	P2p	77
360	"*Protoceletes*" *hirtus* Nazarenko et Perkovsky, 2016		P2b	145

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Cyclominae Schoenherr, 1826 Listroderini LeConte, 1876 Palaechthina Brinck, 1948			
361	"*Listronotus*" *muratus* Scudder, 1890	GreR	P2i-l	78
	Listroderina LeConte, 1876			
362	"*Listroderes*" *differens* (Wickham, 1912)	Flor	P2p	102
363	"*L.*" *eviscerates* (Scudder, 1893)	Flor	P2p	77
	Entiminae Schoenherr, 1823 Entimintae Schoenherr, 1823 Tropiphorini Marseul, 1863			
364	*Primocentron wickhami* Legalov, 2018	GreR	P2i-l	69
365	*Limalophus poinari* Legalov, 2020	PolJ	P2b	71
366	*Scuccinalophus attenboroughi* Legalov, 2016	BalJ	P2b	90
367	*Limalophus compositus* Scudder, 1893	GreR, WhiR GreR	P2i-l, P3r	77
368	*L. contractus* Scudder, 1893	WhiR	P2i-l	77
369	"*L.*" *receptus* Scudder, 1893	WhiR	P3r	77
370	"*Coniatus*" *refractus* Scudder, 1893	RoaM	P3r	77
371	"*Cryptorhynchus*" *durus* Scudder, 1893	GreR	P2i-l	77
372	"*Lepyrus*" *evictus* Scudder, 1893	GreR, RoaM	P2 i-l	77
373	"*Sitona*" *paginarum* Scudder, 1893	RoaM	P2 i-l	77
374		RoaM GreR		
375	"*Otiorhynchus*" *subteractus* Scudder, 1893	RoaM	P2 i-l	77
376	"*Ophryastes*" *grandis* Scudder, 1893	Flor	P2 i-l	77
377	"*O.*" *compactus* Scudder, 1878	Flor	P2 i-l	77
378	"*O.*" *petrarum* Scudder, 1893	Flor	P2 i-l	77
379	"*O.*" *championi* Wickham, 1912	Flor	P2p	102
380	*Geralophus antiquarius* Scudder, 1893	Flor	P2p	77
381	*G. fossicius* Scudder, 1893	Flor	P2p	77
382	*G. lassatus* Scudder, 1893	Flor	P2p	77
383	*G. occultus* Scudder, 1893	Flor	P2p	77
384	*G. pumiceus* Scudder, 1893	Flor	P2p	77
	G. repositus Scudder, 1893	Flor	P2p	77
385	*G. retritus* Scudder, 1893	Flor	P2p	77
386	*G. saxuosus* Scudder, 1893	Flor	P2p	77
387	*G. scudderi* Wickham, 1911	Aix	P2p	76
388	*Centron moricollis* Scudder, 1893		P2p	77
389	*Tenillus firmus* Scudder, 1893		P2p	77
390	*Rhytideres sexsulcatus* (Heer, 1856)	Aix	P3h	146
	=*Phytonomus annosus* Oustalet, 1874			110
	=*Hipporhinus reynesii* Oustalet, 1874			110
391	"*Rh.*" *heeri* (Germar, 1849)		P3h	147
	=*Hipporhinus Matheroni* Nicolas, 1891			148
	=*Hipporhinus similis* Nicolas, 1891			148
	=*Hipporhinus intermedius* Nicolas, 1891	Aix		148
	=*Hipporhinus Marioni* Nicolas, 1891	Aix		148
	=*Hipporhinus pertonii* Nicolas, 1891			148
392	"*Rh.*" *schaumi* (Heer, 1856)		P3h	146
393	"*Hipporhinus*" *brevis* Giebel, 1856		P3h	149
	Entimini Schoenherr, 1823 Entimina Schoenherr, 1823			
394	*Entimus primordialis* Scudder, 1876	GreR	P2i-l	73

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Eudiagogini LeConte, 1874			
395	*Eudiagogus vossi* Legalov, 2018	GreR	P2i-l	69
396	*Tolstonosik oisensis* Legalov, Kirejtshuk et Nel, 2019	OisJ	P2i	81
397	*Oligocryptus sectus* (Scudder, 1893)	Flor	P2p	77
398	*Eudomus pinguis* Scudder, 1893	Flor	P2p	77
399	*E. robustus* Scudder, 1893	Flor	P2p	77
	Hyperitae Lacordaire, 1863 Hyperini Lacordaire, 1863 Cepurina Capiomont, 1867			
400	*Palaeophelypera kuscheli* Legalov, 2013	BalJ	P2b	47
401	"*Geralophus*" *discessus* Scudder, 1893	Flor	P2p	77
402	*Hyperites nadezhkini* Zherikhin, 1989	Biam	P2p	150
	Otiorhynchitae Schoenherr, 1826 Hormorini Horn, 1876			
403	"*Hormorus*" *saxorum* Scudder, 1893	Flor	P2p	77
	Cyphiceritae Lacordaire, 1863 Sciaphilini Sharp, 1891			
404	"*Mitostylus*" *obdurefactus* (Scudder, 1893)	RoaM	P2i-l	77
405	"*M.*" *seculorum* (Scudder, 1890)	GreR	P2i-l	78
406	"*M.*" *abacus* (Scudder, 1893)	WhiR	P3r	77
	Trachyphloeini Lacordaire, 1863 Pseudocneorrhinina Kono, 1930			
407	*Archaeocallirhopalus alekseevi* Legalov et Bukejs, 2015	BalJ	P2b	151
408	*A. larssoni* Legalov, 2013	BalJ	P2b	47
	Polydrusitae Schoenherr, 1823 Sitonini Gistel, 1856			
409	*Sitonitellus egregius* (Haupt, 1956)	Geis	P2l	152
410	*Sitona lata* Theobald, 1937	Klei	P3	112
411	"*S.*" *venustulus* Heyden et Heyden, 1866	Rott	P3h	85
	Anypotactini Champion, 1911			
412	*Paonaupactus gracilis* Legalov, Nazarenko et Perkovsky, 2019	RovJ	P2b	117
413	*P. katyae* Legalov, Nazarenko and Perkovsky, 2019	RovJ	P2b	117
414	*P. microphthalmus* (Zherikhin, 1971)	BalJ	P2b	79
415	*P. sitonitoides* Voss, 1953	BalJ,	P2b	80
	=*Polydrosus scheelei* Voss, 1953	ScanJ,		80
	=*Pyllobius cephalotes* Voss, 1972	PolJ		105
	=*Otiorhynchus pellucidipes* Voss, 1972			105
416	*P. sobrinus* (Voss, 1972)	ScanJ, Balj	P2b	105
417	*P. viridis* (Wanat et Borowiec, 1986)	BalJ, PolJ	P2b	153
	Naupactini Gistel, 1856			
418	"*Hipporhinus*" *ventricosus* (Piton, 1940)	Mena	P1sl-t	99
419	*Arostropsis groehni* Yunakov et Kirejtshuk, 2011	BalJ	P2b	154
420	*A. gusakovi* Legalov, 2020	BalJ	P2b	71
421	*A. perkovskyi* Bukejs et Legalov, 2019	RovJ	P2b	155
422	"*Cyrtomon*" *subterraneus* Wickham, 1911	Flor	P2p	76
423	"*C.*" *florissantensis* Wickham, 1914	Flor	P2p	156

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Geonemini Gistel, 1856			
424	"*Epicaerus*" *dilapsus* (Scudder, 1893)	GreR	P2i-l	77
425	"*E.*" *effossus* (Scudder, 1876)	GreR	P2i-l	73
426	"*E.*" *eradicatus* (Scudder, 1893)	WhiR	P2i-l	77
427	"*E.*" *exanimis* (Scudder, 1876)	GreR	P2i-l	73
428	"*E.*" *excissus* (Scudder, 1893)	RoaM	P2i-l	77
429	"*E.*" *fodinarum* (Scudder, 1893)	GreR	P2i-l	77
430	"*E.*" *saxatilis* (Scudder, 1876)	GreR	P2i-l	73
431	"*E.*" *subterraneus* (Scudder, 1893)	GreR	P2i-l	77
432	"*E.*" *terrosus* (Scudder, 1878)	RoaM, WhiR	P2i-l, P3r	74
433	"*E.*" *evigoratus* (Scudder, 1893)	WhiR	P3r	77
434	*Evopes veneratus* Scudder, 1893	Flor	P2p	77
435	*E. occubatus* Scudder, 1893	Flor	P2p	77
436	"*Lachnopus*" *recuperatus* Scudder, 1893	Flor	P2p	77
437	"*Omileus*" *evanidus* Scudder, 1893	Flor	P2p	77
	Psallidiini Lacordaire, 1863			
438	*Trigonoscuta inventa* Scudder, 1893	Flor	P2p	77
	Eustylini Lacordaire, 1863			
439	*Pseudophaops perditus* (Scudder, 1876)	GreR	P2i-l	73
	Polydrusini Schoenherr, 1823			
440	*Polydrusus archetypus* Zherikhin, 1971	BalJ	P2b	79
441	*P. zherikhini* Legalov, 2020	BalJ	P2b	71
442	*Archaeosciaphilus Marshalli* Legalov, 2012	BalJ	P2b	82
	Brachyderini Schoenherr, 1826			
443	*Palaeocrassirhinus messelensis* Rheinheimer, 2007	Mess	P2l	102
444	*P. rugosithorax* Rheinheimer, 2007	Mess	P2l	102
445	*Palaeocneorhinus messelensis* Rheinheimer, 2007	Mess	P2l	102
446	"*Brachyderes*" *rugosus* (Deichmueller, 1881)	Kuts	P2b	126
447	*Brachymycterus curculionoides* Heyden et Heyden, 1866	Rott	P3h	85
	=*Eurychirus induratus* Heyden et Heyden, 1866			85
	=*Rhinocyllus improbus* Heyden et Heyden, 1866			85
	=*Varus ignotus* Schlechtendal, 1894			89
	Tanymecini Lacordaire, 1863 Tainophthalmina Desbrochers des Loges, 1873			
448	*Protainophthalmus asperulus* (Heer, 1856)	Aix	P3h	146
	=*Brachyderes aquisextanus* Oustalet, 1874			110
	=*Brachyderes longipes* Oustalet, 1874			110
	= *Cleonus Marcelli* Oustalet, 1874			110
449	*P. margarum* (Germar, 1849)	Aix	P3h	147
	=*Sitona antiqua* Giebel, 1856			149
450	*P. punctulatus* (Nicolas, 1891)	Aix	P3h	148
451	*P. regularis* (Nicolas, 1891)	Aix	P3h	148
452	*P. thaisi* (Nicolas, 1891)	Aix	P3h	148
453	*P. tuberculatus* (Nicolas, 1891)	Aix	P3h	148
	Pandeleteina Pierce, 1913			
454	*Pandeleteinus nudus* Wickham, 1917	Flor	P2p	138
	Tribe incertae sedis			

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
455	"*Sitona*" *exitiorum* Scudder, 1893	Flor	P3r	77
456	"*Strophosomus*" *marcelini* Theobald, 1937	Cela	P2p	112
457	"*Sciaphilus*" *nigrescens* Theobald, 1937	Cela	P2p	112
458	"?*Argoptochus*" *incertus* Theobard, 1937	Cela	P2p	112
459	"*Bagous*" *atavus* Oustalet, 1870	Core	P3r	119
460	"*Brachycerus*" *exilis* Germar, 1837	Aix	P3h	157
461	"*Phytonomus*" *firmus* Heer, 1856	Aix	P3h	146
	Curculionidae incertae sedis			
462	*Otiorhynchites williamsi* Cockerell, 1943	Mirs	P1	158
463	*O. aterrimus* Cockerell, 1925	Sunc	P1d	134
464	*O. crassus* Cockerell et Wagner, 1936	Sunc	P1d	159
465	*O. densepunctatus* Haupt, 1956	Geis	P2l	152
466	*O. fossilis* Scudder, 1893	GreR	P2i-l	77
467	*O. commutatus* Scudder, 1893	RoaM	P2i-l	77
468	*O. tysoni* Scudder, 1893	RoaM	P2i-l	77
469	*O. absentivus* Scudder, 1893	Flor	P2p	77
470	*O. florissantensis* Wickham, 1911	Flor	P2p	76
471	*O. wilcoxianus* Wickham, 1929	Flor	P2p	160
472	*Curculionites taxodii* Heer, 1870	Star	P1d	161
473	*C. angustior* Cockerell et Wagner, 1936	Sunc	P1d	159
474	*C. epistictus* Cockerell et Wagner, 1936	Sunc	P1d	159
475	*C. eustictus* Cockerell et Wagner, 1936	Sunc	P1d	159
476	*C. harringtoni* Cockerell, 1925	Sunc	P1d	134
477	*C. jujuensis* Cockerell, 1925	Sunc	P1d	134
478	*C. latiusculus* Cockerell et Wagner, 1936	Sunc	P1d	159
479	*C. magdalinus* Cockerell et Wagner, 1936	Sunc	P1d	159
480	*C. megastictus* Cockerell et Wagner, 1936	Sunc	P1d	159
481	*C. microstictus* Cockerell et Wagner, 1936	Sunc	P1d	159
482	*C. parastictus* Cockerell et Wagner, 1936	Sunc	P1d	159
483	*C. stebingeri* Cockerell, 1926	Sunc	P1d	131
484	*C. sunchalicus* Cockerell et Wagner, 1936	Sunc	P1d	159
485	*C. wielandi* Cockerell, 1925	Sunc	P1d	134
486	*C. marginatus* Giebel, 1856	Corf	P2l	149
487	*C. punctillatus* Haupt, 1950	Geis	P2l	124
488	*C. bartonicus* Cockerell, 1920	Bour	P2l	162
489	*C. brenthiformis* Cockerell, 1920	Bour	P2l	162
490	*C. optimus* Cockerell, 1920	Bour	P2l	162
491	*C. ovatus* Oustalet, 1870	Core	P3r	119
492	*C. morosus* Heer, 1856	Aix	P3h	146
493	*Calandrites defessus* Scudder, 1893	RoaM	P2i-l	77
494	*C. cineratius* Scudder, 1893	GreR,RoaM	P2i-l	77
495	*C. hindsi* Cockerell, 1917	Flor	P2p	
496	*C. ursorum* Cockerell, 1918	Flor	P2p	
497	*Ophryastites gardneri* Cockerell, 1920	Bour	P2l	
498	*O. absconsus* Scudder, 1893	Flor	P2p	77
499	*O. cinereus* Scudder, 1893	Flor	P2p	77
500	*O. digressus* Scudder, 1893	Flor	P2p	77
501	*O. hendersoni* Cockerell, 1917	Flor	P2p	
502	*O. miocenus* Wickham, 1912	Flor	P2p	
503	*O. dispertitus* Scudder, 1893	WhiR	P3r	77
504	*O. heribaudi* Piton, 1936	PuStJ	P3	
505	*Mononychites punctipennis* Haupt, 1956	Geis	P2l	
506	*M. rotundatus* Haupt, 1956	Geis	P2l	
507	*Syntomostylus rudis* Scudder, 1893	RoaM	P2i-l	
508	"*S.*" *fortis* Cockerell, 1909	GreR	P2i-l	
509	"*Otiorhynchus*" *flaccus* Scudder, 1893	RoaM	P2i-l	77

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
510	"*Otiorhynchus*" *tumbae* Scudder, 1890	GreR	P2i-l	
511	"*Pachylobius*" *depraedatus* Scudder, 1893	RoaM	P2i-l	77
512	"*Pachylobius*" *compressus* Scudder, 1893	GreR,RoaM	P2i-l	77
513	"*Phyllobius*" *antecessor* Scudder, 1893	RoaM	P2i-l	77
514	"*Rhyssomatus*" *tabescens* Scudder, 1893	WhiR	P3r	77
515	"*Scythropus*" *somniculosus* Scudder, 1893	WhiR	P3r	77
516	"*Phyllobius*" *avus* Scudder, 1893	RoaM	P2i-l	77
517	"*Phyllobius*" *carcerarius* Scudder, 1893	RoaM	P2i-l	77
518	"*Pachylobius*" *yungi* Piton, 1936	Gaub	P3	164
519	"*Tanymecus*" *gautieri* Piton, 1936	Gaub	P3	164
520	"*Pachylobius*" *martyi* Piton et Theobald, 1937	PuStJ	P3	166
521	"*Lachnopus*" *dilatatus* Theobald, 1937	Klei	P3	166
522	"*Cleonus*" *foersteri* Theobald, 1937	Klei	P3	112
523	"*Lachnopus*" *humatus* Scudder, 1893	Flor	P2p	77
524	"*Sphenophorus*" *elegans* Theobald, 1935	Aix	P3h	130
	Platypodidae Shuckard, 1840 Tesserocerinae Strohmeyer, 1914 Tesserocerini Strohmeyer, 1914			
525	*Eoplatypus jordali* Peris, Solórzano Kraemer et Cognato, 2017	BalJ	P2b	167
526	*Cenocephalus aniskini* Legalov, 2020	BalJ	P2b	71
	Scolytidae Latreille, 1804 Hylesininae Erichson, 1836 HylastiniLeConte, 1876			
527	*Hylastes aterites* Schedl, 1947	BalJ	P2b	168
528	"*H.*" *americanus* Wickham, 1913	Flor	P2b	97
529	*Hylurgops corpulentus* Schedl, 1947	BalJ	P2b	168
530	*H. dubius* (Hagedorn, 1906)	BalJ	P2b	169
531	*H. electrinus* (Germar, 1813)	BalJ	P2b	170
532	*H. granulatus* (Schedl, 1947)	BalJ	P2b	168
533	*H. pilosellus* Schedl, 1947	BalJ	P2b	168
534	*H. schellwieni* (Hagedorn, 1906)	BalJ	P2b	168
535	*H. tuberculatus* Schedl, 1947	BalJ	P2b	168
536	*H. piger* Wickham, 1913	Flor	P2p	97
	HylesininiErichson, 1836			
537	*Hylesinus extractus* Scudder, 1893	Flor	P2p	77
538	*H. hydropicus* (Wickham, 1916)	Flor	P2p	101
539	*H. neli* Petrov et Zherikhin, 2004	Aix	P3h	171
540	"*H.*" *facilis* Heer, 1856	Aix	P3h	146
	Hylurgini Gistel, 1848			
541	*Xylechinus mozolevskae* Petrov et Perkovsky, 2008	RovJ	P2b	172
542	*Klesovia pubescens* Petrov et Perkovsky, 2018	RovJ	P2b	173
543	*Xylechinites anceps* Hagedorn, 1906	BalJ	P2b	169
	Phloeosinini Nuesslin, 1912			
544	*Phloeosinus assimilis* (Schedl, 1947)	BalJ	P2b	168
545	*Ph. brunni* (Hagedorn, 1906)	BalJ	P2b	169
546	*Ph. regimontanus* (Hagedorn, 1906)	BalJ	P2b	169
547	*Ph. rehi* (Hagedorn, 1906)	BalJ	P2b	169
548	*Ph. robustus* (Schedl, 1947)	BalJ	P2b	168
549	*Ph. sexspinosus* (Schedl, 1947)	BalJ	P2b	168
550	*Ph. tuberculifer* (Schedl, 1947)	BalJ	P2b	168
551	*Ph. wolffi* (Schedl, 1947)	BalJ	P2b	168

Table 2. *Cont.*

No.	Taxon	Locality	Age	Sources
	Phloeotribini Chapuis, 1869			
552	*Phloeotribus zimmermani* Wickham, 1916	Flor	P2p	101
	Polygraphini Chapuis, 1869			
553	*Carphoborus keilbachi* (Schedl, 1947)	BalJ	P2b	168
554	C. *posticus* (Schedl, 1947)	BalJ	P2b	168
	Scolytinae Latreille, 1804 DryocoetiniLindemann, 1877			
555	*Dryocoetes diluvialis* (Wickham, 1916)	GreR BalJ	P2i-l P2b	101
556	*Taphramites gnathotrichus* Schedl, 1947	RovJ	P2b	168
557	*T. rovnoensis* Petrov et Perkovsky, 2008	BalJ	P2b	172
558	*Taphrorychus immaturatus* Schedl, 1947			168
	Incertae sedis			
559	"*Dryocoetes*" *carbonarius* Scudder, 1878	GreR	P2i-l	74
560	"*Trypodendron*" *impressus* Scudder, 1876	GreR	P2i-l	73
561	"*Polygraphus*" *wortheni* Scudder, 1893	RoaM	P2i-l	77
562	*Xyleborites longipennis* Wickham, 1913	Flor	P2p	97
563	*Duartia pulchella* Martins-Neto, 2001	Fons	P2p	174
	Curculionoidea incertae sedis			
564	*Thryogenosoma cariniger* (Motschulsky, 1857)	BalJ	P2b	175

Abbreviations for localities and ages are given in Material and methods.

3.1. Paleocene Weevil Fauna

The weevil fauna of the Paleocene is the poorest among the Paleogene faunas. This is primarily due to the small number of Paleocene localities, as well as the lack of Paleocene amber with Curculionoidea. Curculionoid beetles were found in five localities, including France, Svalbard (Denmark), south of the Russian Far East, China (Hong Kong) and Argentina (Figure 2). Three of these localities are of early Paleocene age (Arkhara, Starostin and Sunchal) and one of them is late Paleocene (Menat). The age of Mirs Bay from Hong Kong, the Ping Chau Formation (China) is assumed to be Paleocene, however the stage is not specified [176].

Twenty seven species were described from the Paleocene (Figure 3). Additionally, 18 species were known from Starostin, Sunchal and Mirs based on isolated elytra, which are assigned to recent genera or placed in the formal genera *Otiorhynchites* and *Curculionites* that were established for elytra [131,134,158,159,161]. "*Cossonus*" *devoratus* and "*Anthonomus*" *sunchalensis* from the early Paleocene of Argentina are not only the earliest findings of the tribes Cossonini and Anthinomini but also the first appearance of the subfamilies Cossoninae and Curculioninae in the fossil record. The only early Paleocene beetle represented by an almost complete impression is *Archaralites zherichini* of the subfamily Molytinae (earliest record of this subfamily) from the Danian of Outer Manchuria.

Eight species represented as complete impressions are known from Selandian-Thanetian of France. The families Ithyceridae, Rhynchitidae, Attelabidae, Brentidae and Curculionidae are recorded. Ithyceridae is represented by one species of the subfamily Chilecarinae. This is the only representative of the family in the Paleocene and the last find in the Eastern Hemisphere. Records of Ithyceridae are common in Cretaceous of the Northern Hemisphere [29,30,48,49,51,177]. One species, the genus of which requires clarification, is from the subfamily Rhynchitinae of the family Rhynchitidae. The families Attelabidae and Brentidae are each represented by one species of the recent tribe Attelabini and the extinct species of the recent genus *Perapion* from the tribe Aplemonini (earliest record, 61.0–59.0 Ma).

Four species belong to the family Curculionidae. One species of the recent genus *Lixus* is from the subfamily Lixinae (earliest record, 61.0–59.0 Ma). Two species of the subfamily Curculioninae, one of which belongs to the extinct genus of the tribe Curculionini (earliest record, 61.0–59.0 Ma), and the systematic position of the second ("*Centrinus*" *longipes*) in the subfamily require clarification. One species, "*Hipporhinus*" *ventricosus* with an unclear generic position, is in the tribe Naupactini from the diverse subfamily Entiminae (earliest record, 61.0–59.0 Ma). Representatives of other families were not found in the Paleocene.

Most of the forms represented in the Paleocene belong to widespread groups (Attelabini, Aplemonini (*Perapion*), Lixini (*Lixus*), Cossonini (*Cossonus*), Curculionini, Anthonomini (*Anthonomus*)), are now found in the recent fauna. Two species show characters typical of the Paleocene fauna of Europe. *Petropsis rostratus* somehow links the fauna of Menat with recent relict fauna of the Chilean-Patagonian and Australian regions, where modern representatives of the tribe Chilecarini live [178,179]. The discovery of species of the tribe Naupactini similar to Neotropical forms provides additional evidence for the faunogenetic relationships of the Paleocene Europe, with Central and South America. The ecological composition of these beetles is homogeneous. Mostly they are forest forms. *Petropsis rostratus*, like the recent Ithyceridae of the subfamily Chilecarinae, could be associated with gymnosperms from the family Cupressaceae [178,179], which were found at the site [99]. "*Phytonomus*" *punctatus* (Attelabini) folded tubes from angiosperm leaves, for example, from oak known from the deposit [99], as recent representatives of this tribe [180]. *Archaralites zherichini* and "*Cossonus*" *devoratus* developed in wood. *Menatorhis elegans*, like modern Curculionini, developed in flower buds or fruits of angiosperms [181], for example, on oak, several species that are known from this locality [99]. "*Anthonomus*" *sunchalensis* could be connected with trees or shrubs. Two species were very probably associated with herbaceous vegetation, the recent species of the genus *Lixus* usually develop on herbaceous plants and, as an exception, with shrubby plants [182]. *Lixus ligniticus* could be associated with *Atriplex* (Amaranthaceae). *Perapion menatensis,* as well as recent representatives of the genus, probably developed on Polygonaceae [183]. Polygonaceae are not known from Menat but pollen of *Polygonum* was recorded in the late Paleocene of France [184]. Curculionoidea of Menat shows the presence of coniferous-deciduous forest and herbaceous near-water vegetation.

3.2. Eocene Weevil Fauna

As Many as 441 species of weevil-shaped beetles were described from Eocene deposits (Figure 4), which originated from 24 localities. Undescribed forms are known from Quilchena (Canada) [185], Romanian amber [186], Huitrera Formation (Argentina) [187] and Bitterfeld amber.

3.2.1. Review of Curculionoidea Families in the Eocene

Nemonychidae in the Eocene

Three species of the family Nemonychidae from the extinct subfamily Cretonemonychinae and recent Cimberidinae were found in the Eocene. The subfamily Cretonemonychinae is also known in the early and late Cretaceous [29,30,177].

Anthribidae in the Eocene

Nearly thirty species of Anthribidae were described from the early, middle and late Eocene of America and Europe. The subfamily Anthribinae is most represented. Twenty seven species from eight tribes are known in this subfamily from the Eocene. Twelve species from three genera of the tribes Mecocerini, Allandrini, Oiserhinini and Zygaenodini were described from European amber and 15 species from seven genera of the tribes Cratoparini, Anthribini, Ecelonerini and Tropiderini from North American localities. There are no common genera and tribes between the American and European deposits. The subfamily Choraginae is represented by two species from two tribes. "*Choragus*" *fictilis*

of the tribe Choragini was described from the Eocene of the United States and *Eduardoxenus unicus* of the tribe Valenfriesiini from Rovno amber.

Ithyceridae in the Eocene

Two American genera *Eoceneithycerus* and *Ithyceroides* close to the recent American genus *Ithycerus* were found in North America.

Belidae in the Eocene

Nine species from the subfamily Oxycoryninae belong to the family Belidae. Several species of the tribe Oxycraspedini were found in Baltic amber, one of which was described. The tribe Metrioxenini is found both in American deposits and the middle Eocene amber. The extinct tribe Palaeorhopalotriini, close to the recent Central American tribe Allocorynin, was found in the Eocene of France.

Rhynchitidae in the Eocene

The family Rhynchitidae is found in American and European deposits and is represented by 34 described species. Five species of the genus *Baltocar* of the tribe Sanyrevilleini from the subfamily Sayrevilleinae are known only from Baltic amber. The subfamily Rhynchitinae is represented by species of the tribes Auletini, Rhynchitini and Eugnamptini. Thirteen species from subtribes Auletina, Pseudauletina and Pseudomesauletina were described in the tribe Auletini. Most species (nine) are known from the terminal Eocene of Florissant. Finds of Auletini are rare in the Green River deposits as well as in Baltic and Rovno amber. The tribe Rhynchitini is represented by 12 species, with nine of them recorded in the late Eocene of the United States and their affiliation to the subtribes has not yet been established. Two species from Baltic amber belong to the archaic subtribes Temnocerina and Perrhynchitina. One genus with three species of the tribe Eugnamptini is described from the Florissant beds.

Attelabidae in the Eocene

One or two extinct genera, *Palaeoalatorostrum* of the subtribe Attelabini from the tribe Attelabini and *Paleoclinolabus* of the subtribe Clinolabina from the tribe Euscelini, belonging to the subfamily Attelabinae of the Attelabidae, are known from the middle Eocene of Germany and the Late Eocene of the United States.

Brentidae in the Eocene

The family Brentidae is represented in the Eocene by three subfamilies, the Apioninae, Nanophyinae and Brentinae. Thirty six species belong to this family. The subfamily Apioninae is the most species-rich. The primitive tribes Tanaini, Rhadinocybini, Notapionini and Palaeotanaini each have one monotypic genus in the early Eocene of Europe and Asia, as well as in the end of the middle Eocene of Europe. The supertribes Aspidapiitae and Apionitae include representatives of recent (*Pseudaspidapion*, *Melanapion*, *Conapium*, *Perapion*, *Apionion* and *Toxorhynchus*) and extinct genera (*Baltoapion*, *Succinapion*, *Baltoconapium*, *Electrapion*). A third of the species of the latter groups belong to the extinct genera and two-thirds to the recent ones. Both known tribes (Nanophyini and Corimaliini) of the subfamily Nanophyinae were found in the Eocene. Three extinct genera of the Nanophyini were described from the middle Eocene of the USA and Baltic amber. One species placed in the genus *Corimalia* is known from the middle Eocene of France. The subfamily Brentinae is recorded only in the middle Eocene of Germany, where the extinct genus *Eckfelderolispa* with three species and extinct representative of the recent genus *Cerobates*, belonging to the tribe Trachelizini, were described.

Curculionidae in the Eocene

The Curculionidae is the Main group of Eocene Curculionoidea numbering 290 described species. All known subfamilies (Erirhininae, Molytinae, Lixinae, Dryophthorinae, Cossoninae, Conoderinae, Curculioninae, Cyclominae and Entiminae) are represented in the Eocene (Figure 5).

The most primitive subfamily Erirhininae is represented by species from the tribes Erirhinini and Dorytomini. Several species from different genera of the former tribe were recorded in the early Eocene of England, the middle and the late Eocene of the USA. The genus *Dorytomus* from the Dorytomini includes nine extinct species from Baltic and Rovno amber, as well as species from the terminal Eocene of North America.

The subfamily Molytinae is one of the most diverse groups of Curculionidae [39,188]. The tribes Molytini, Plinthini, Acicnemidini, Magdalini, Cleogonini, Sciabregmini, Camptorhinini, Aedemonini and Cryptorhynchini were found in Eocene deposits. Two extinct genera, *Furhylobius*—with one species from the early Eocene of Denmark—and *Archaeoheilus*—with five species from the early-middle and terminal Eocene of the USA—belong to the tribe Molytini. One species of the recent genus *Leiosoma* of the tribe Plinthini was described from Baltic amber. One extinct genus *Electrotribus* of the tribe Acicnemidini is known from Baltic amber, where its species are one of the most common Curculionidae. In other Eocene localities, neither the tribe Acicnemidini, nor this genus were found. "*Magdalis*" *sedimentorum* of the tribe Magdalini is recorded from the Eocene of the United States. The American tribe Cleogonini is represented in the Eocene of the United States by two species of the extinct genus *Rhysosternum* and one species of the genus *Conotrachelus*. The extinct tribe Sciabregmini with one genus is known from three species, one from the early Eocene of France and two from the early-middle Eocene of North America. Two fossil genera from the early Eocene of England belong to the tribe Camptorhinini. The Afrotropical tribe Aedemonini was recently discovered in Baltic amber. Eleven species from six genera (five of which are extinct) of the tribe Cryptorhynchini are known from the Eocene.

The subfamily Lixinae is represented in the Eocene by only the tribe Cleonini. The extinct genus *Eocleonus* with one species and five species formally placed in the genus *Cleonus* were described from the late Eocene of the United States.

Eleven Eocene species belong to the subfamily Dryophthorinae. Most species (seven) are from the tribes Stromboscerini and Dryophthorini living in the forest litter. The former tribe is noted in Baltic and Rovno amber and the latter is in early Eocene Oise amber and late Eocene Florissant deposits. Four species of the tribe Sphenophorini were described from the late Eocene of the United States.

The subfamily Cossoninae is represented by the tribe Dryotribini in middle Eocene amber and Cossonini in early-middle and late Eocene deposits of the United States.

The diverse subfamily Conoderinae is divided into four supertribes [40], three of which are found in Eocene. Thirty species belong to the supertribe Bariditae of which twenty nine were described from early-middle and late Eocene of the USA and one from the middle Eocene of England. Most North American species belong to the subtribe Coelonertina of the tribe Apostasimerini. They were described both in recent (*Geraeus*, *Pachybaris*, *Nicentrus*) and extinct (*Miogeraeus*, *Lithogeraeus*, *Steganus*) genera. Six species belong to the tribe Baridini. These are four representatives of the recent genus *Baris* and one of the extinct genus *Catobaris* (Baridina), as well as one species of the recent genus *Eurhinus* (Eurhinina). Two monotypic extinct genera of the recent tribe Conoderini and the extinct tribe Palaeomallerini are from the early Eocene of France and the early-middle Eocene of the United States belong to the supertribe Conoderintae. The supertribe Ceutorhynchitae is represented by ten species of the tribe Ceutorhynchini and one species of the tribe Cnemogonini, which was noted in the late Eocene of the United States. Two genera, the recent genus *Ceutorhynchus* Marked from the early to late Eocene of Europe and the USA and extinct *Baltocoeliodes* from Baltic amber, belong to the tribe Ceutorhynchini.

The subfamily Curculioninae is the second largest group by species of Eocene Curculionidae. Nine tribes with 53 species are known from the Eocene. The tribe Acalyptini is represented by an extinct monotypic genus in early Eocene Oise amber. Two species from Baltic amber belong to the

tribe Ellescini. The monotypic tribe Palaeoanoplini is known only from the middle Eocene of Europe. Fifteen species were described in the tribe Curculionini. Representatives of the subtribes Erganiina and Timolina are found only in Baltic amber. The most common group in the modern fauna on all continents is the subtribe Curculionina. In the Eocene, all (without *Curculio havighorstensis*) species of this subtribe were described from the terminal Eocene of the USA and one species from the early Eocene of Germany. The situation is similar with the tribe Anthonomini. All Eocene species of this tribe are known only from North America. The tribe Eugnomini is represented by five species from four genera found in Baltic amber. The extinct subtribe Palaeorhamphina with three species from Baltic amber and the recent subtribe Rhamphina with species of the recent genera *Orchestes* and *Tachyerges* from middle Eocene amber and the terminal Eocene of the USA belong to the tribe Rhamphini. The tribe Tychiini is noted in Baltic amber and the late Eocene of the USA, where it is represented by five species from the recent genera *Sibinia*, *Tychius*, *Macrorhoptus* and the extinct genus *Eocenesibinia*. The tribe Camarotini is noted in the middle Eocene of Europe and the late Eocene of North America.

The subfamily Cyclominae is known only from the Eocene of the USA, where species of the recent genera *Listronotus* and *Listroderes* were described. Ьщыеplace of the numberrous species among the Eocene Curculionidae are in the subfamily Entiminae. Ninety species were described from the tribes Tropiphorini, Entimini, Eudiagogini, Hyperini, Hormorini, Sciaphilini, Trachyphloeini, Sitonini, Anypotactini, Naupactini, Geonemini, Psallidiini, Eustylini, Polydrusini, Brachyderini and Tanymecini. Twenty four species belong to the tribe Tropiphorini. All but one representative of this tribe were found in the Eocene of North America and only one species of the genus *Limalophus* has recently been described from middle Eocene Baltic (Polish) amber. The Neotropical tribe Entimini is known from the early-middle Eocene Green River deposits by one extinct species of the recent genus *Entimus*. The tribe Eudiagogini is now distributed only in the Western Hemisphere [26]. *Tolstonosik oisensis* was found in the early Eocene of France, *Eudiagogus vossi* from the early-middle Eocene, *Oligocryptus sectus* and the genus *Eudomus* with two species from the late Eocene of the United States. Three species of the tribe Hyperini from the subtribe Cepurina have been described since the end of the middle Eocene of Europe, the late Eocene of the USA and the Far East of Russia. One species, "*Hormorus*" *saxorum* Scudder, 1893 from the late Eocene of the USA was described in the American tribe Hormorini. The tribe Sciaphilini with a contemporary centre of diversity in the Western Palaearctic [26] was found only in the early-middle Eocene of North America. The tribe Trachyphloeini is represented by the extinct genus *Archaeocallirhopalus* with two species belonging to the subtribe Pseudocneorrhinina, which is now distributed in East Asia. One species of the extinct genus *Sitonitellus* from the middle Eocene of Germany was assigned to the tribe Sitonini. The Neotropical tribe Anypotactini was found in the middle Eocene of Europe. In Baltic amber, this is one of the most common groups. It is interesting to note that this tribe was not found in the Eocene deposits of North America. The tribe Naupactini is noted in Baltic and Rovno amber and in the late Eocene of the Florissant. Thirteen species of the tribe Geonemini are found in the Eocene of the United States. The tribe Psallidiini is represented by one species of the genus *Trigonoscuta* from the terminal Eocene of North America. The extinct genus *Pseudophaops* of the tribe Eustylini was described from the early-middle Eocene of Green River. Two species of the genus *Polydrusus* and one species of the extinct genus *Archaeosciaphilus* of the tribe Polydrusini were found in Baltic amber. Three species from extinct genera *Palaeocrassirhinus* and *Palaeocneorhinus* from the Lutetian of Germany and one species placed in the genus *Brachyderes* from the Bartonian of the Czech Republic belong to the tribe Brachyderini. Only one species of the tribe Tanymecini was described in the recent genus *Pandeleteinus* from the late Eocene of North America.

Platypodidae in the Eocene

The family Platypodidae, with two species of the tribe Tesserocerini, were described from Baltic and Romanian amber [71,167,186,189].

Scolytidae in the Eocene

Scolytidae is represented by 35 species, 24 of which were described from Baltic and Rovno amber. Twenty six species belong to the subfamily Hylesininae and four to Scolytinae. The systematic position of five species requires clarification. Three genera are extinct, known only from the late Eocene and nine genera are recent. The genera *Hylurgops* and *Phloeosinus* are the richest in species with 8 species in each. The largest number of species (21) of bark beetles was described from Baltic amber.

3.2.2. Early Eocene Weevil Fauna

Early Eocene (Ypresian) localities (Figure 6) are in the USA, England (Peckham, London Clay), France (Oise amber), Denmark (Mors), Germany (Havighorst) and the south of the Russian Far East (Tadushi). Twenty one species of Curculionoidea were described from these localities (Figure 7). The families Anthribidae, Ithyceridae, Brentidae, Curculionidae and Scolytidae were recorded for Oise amber [190] from the early Eocene. Unfortunately, the fauna of Oise amber and the London clays include only 7–8 described species, with 1–2 species known (Figure 8) from other localities. The USA contains representatives of the subfamily Ithycerinae now living in North America and has a fundamentally different biota from the rest of the Eocene faunas. Common species and genera intermediate between the early Eocene faunas are absent. Representatives of the tribes Oiserhinini, Palaeotanaini, Sciabregmini, Cryptorhynchini, Dryophthorini, Conoderini, Acalyptini, Eudiagogini are found in Oise amber, Ceutorhynchini in Peckham, Curculionini in Havighorst, Erirhinini, Camptorhinini and Cryptorhynchini in London Clay, Molytini in Mors and Tanaini in Tadushi. Here are found some of the earliest records of representatives of the tribes Sciabregmini (53.0 Ma), Cryptorhynchini (54.0–50.0 Ma), Dryophthorini (53.0 Ma), Eudiagogini (53.0 Ma), Ceutorhynchini and Camptorhinini (54.0–50.0 Ma) and the latest find of the tribe Tanaini in the fossil record. The tribes Oiserhinini, Palaeotanaini, Conoderini and Acalyptini are noted only in the early Eocene. The Oise amber fauna is the most diverse in taxonomic composition and includes four families Anthribidae, Brentidae, Curculionidae and Scolytidae. Only Curculionidae were described from Peckham, London Clay, Havighorst and Mors.

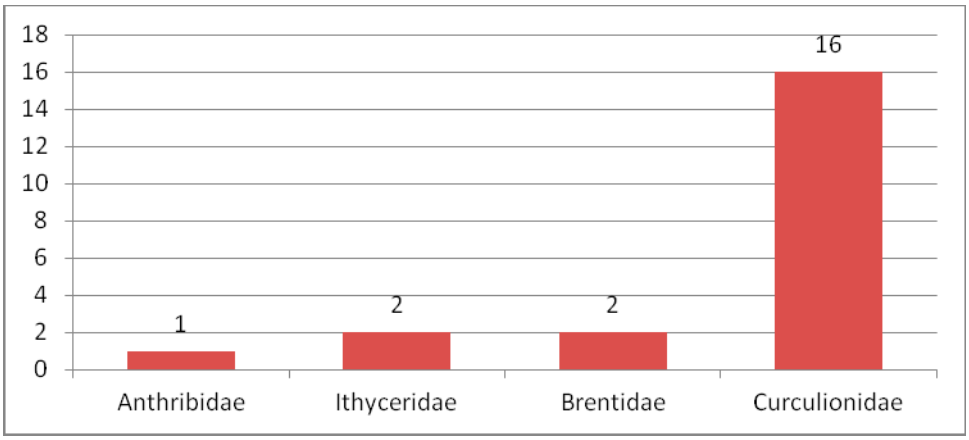

Figure 7. Composition of species of Curculionoidea in the Early Eocene fauna.

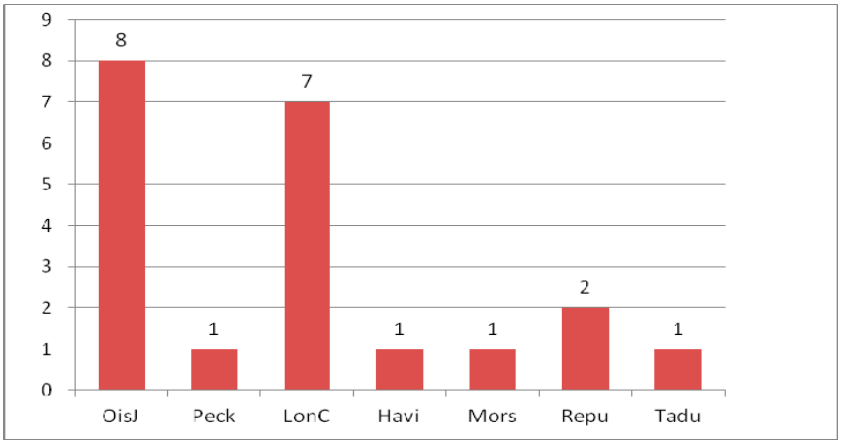

Figure 8. Composition of Curculionoidea species between Early Eocene localities.

The connections between the Paleocene and the early Eocene faunas are in a similar fauna structure with a dominance of Curculionidae and the presence of Ithyceridae. Common genera are not found. Almost all of the early Eocene Curculionidae were associated with trees. The only species which could develop on herbs was "*Ceutorhynchus*" *eocenicus*.

3.2.3. Bridgerian Weevil Fauna

Within the American localities Green River and Roan Mountain of the Green River Formation (Figure 9), dating from the end of the early to the beginning of middle Eocene, 75 weevil species were described, with six being common to both localities. Two species of the family Nemonychidae, six species of the family Anthribidae, one species of the family Belidae, one species of the family Rhynchitidae, three species of the family Brentidae, 58 species of the family Curculionidae and four species of the family Scolytidae were described (Figure 10). Entiminae dominate the Curculionidae (Figure 11).

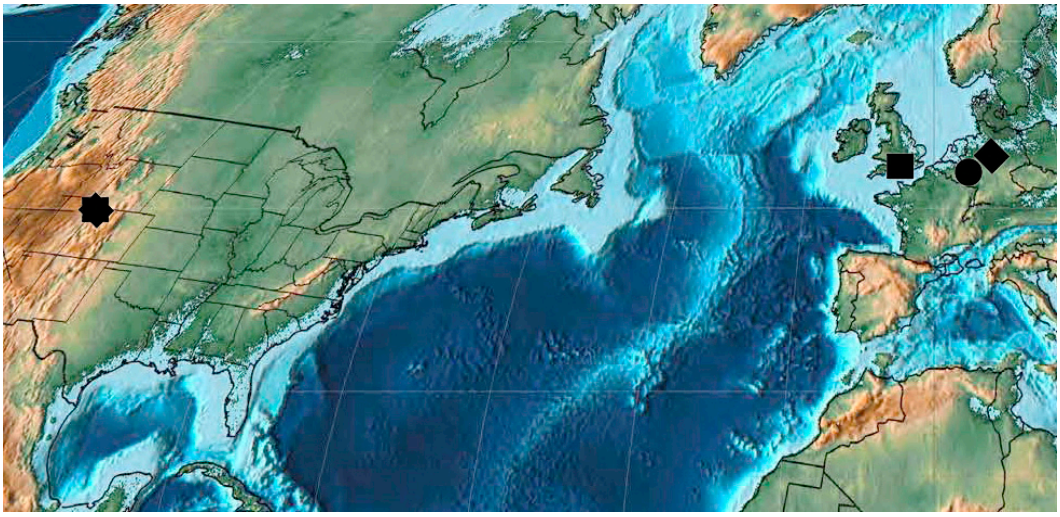

Figure 9. Lutetian Curculionoidea deposits: octagon—Roan Mountain and Green River; square—Corfe and Bournemouth; circle—Messel and Eckfelder Maar, rhombus—Geiseltal.

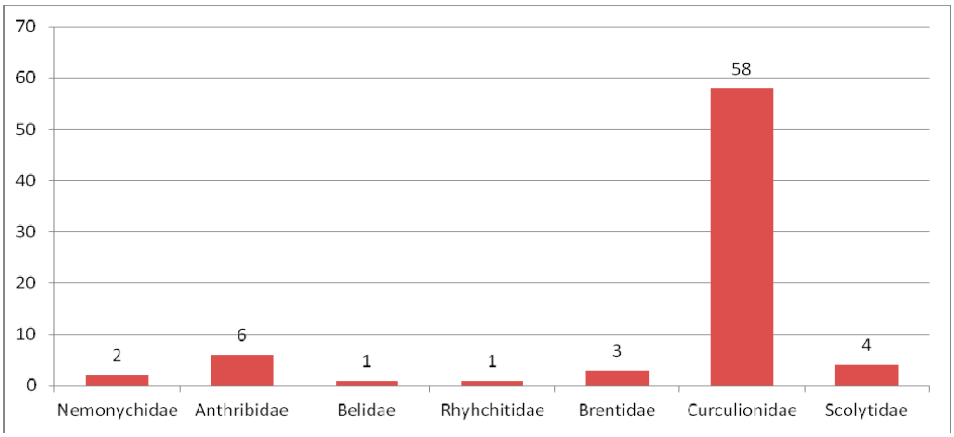

Figure 10. Composition of species of Curculionoidea in the Green River Formation.

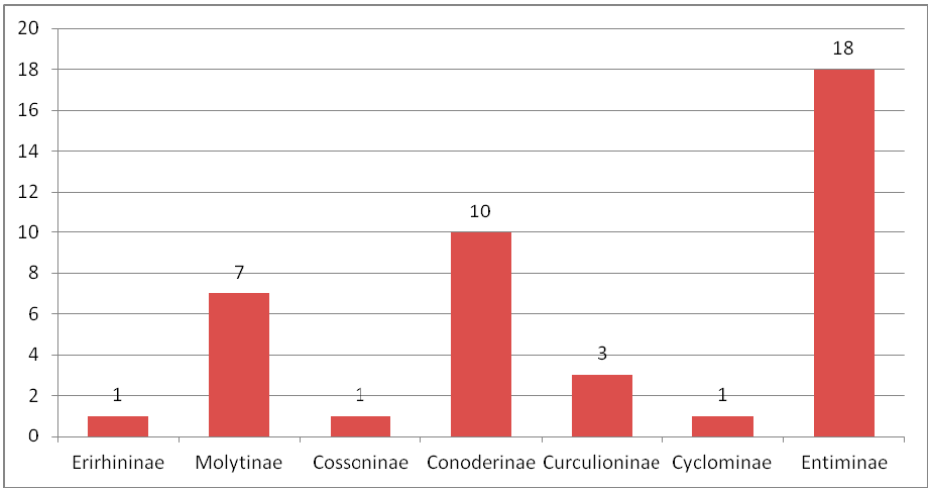

Figure 11. Composition of species of Curculionidae in the Green River Formation.

Here are the earliest records (53.5–48.5 Ma) of the subfamilies Nanophyinae, Conoderinae and Cyclominae, tribes Eocaenonemonychini, Cratoparini, Anthribini, Tropiderini, Choragini, Metrioxenini, Apionini, Apostasimerini, Listroderini, Tropiphorini, Entimini, Sciaphilini, Geonemini, Eustylini and Dryocoetini in the fossil record. The faunas of Green River (51 species) and Roan Mountain (30 species) are very similar. In addition to common species, the generic composition is similar also. Five genera (*Sciabregma*, *Lithogeraeus*, *Anthonomus*, *Mitostylus* and *Epicaerus*) are shared by both localities. More samples were collected from the Green River and accordingly more described species. Roan Mountain has a depleted version of the Green River but representatives of the tribes Metrioxenini, Apionini, Erirhinini, Cossonini, Ceutorhynchini and the extinct genus *Steganus* are known only from this locality. Representatives of Nemonychidae, Anthribidae, Rhynchitidae, Aplemonini, Nanophyinae, Molytini, Cryptorhynchini, Conoderintae, *Primocentron*, *Limalophus*, Entimini, Eudiagogini, Eustylini and Dryocoetini are found in the Green River.

The early-middle Eocene faunas of the Green River Formation are quite isolated and do not show obvious connections with other weevil faunas. The genus *Perapion* connects the Green River fauna with the Paleocene of Menat, the tribe Molytini with the Paleocene of Arkhara, the genera *Cossonus* and *Anthonomus* with the Paleocene of Argentina but these widespread groups do not show specificity of the faunogenetic relationships. Two taxa, the genus *Sciabregma* and the tribe Eudiagogini, show specific relationships between the early Eocene of France and the early-middle Eocene of North America. Most of the Curculionoidea of the Green River were associated with forests. It can be assumed that

Aplemonini, Nanophyini, Ceutorhynchini, Apostasimerini, Listroderini and possibly some Entiminae lived on riverine meadows.

3.2.4. Middle Eocene Weevil Fauna

The middle Eocene consists of two stages, Lutetian and Bartonian. Lutetian localities (Figure 9) are Corfe with one described Curculionoid beetle species, Bournemouth with five species (England), Messel with four species, Geiseltal with six species and Eckfelder Maar with four species (Germany). The systematic position of nine species requires clarification. Here are the earliest records of the subfamily Brentinae (48.27 ± 0.22–47.0 Ma) and the tribes Baridini (50.0–42.0 Ma), Brachyderini (48.27 ± 0.22–47.0 Ma) and Sitonini (47.5–42.5 Ma) in the fossil record. Comparison of the fauna of the Lutheian localities among themselves is impossible due to the small number of described forms. I note that the genera *Palaeoalatorostrum*, *Eckfelderolispa*, *Cryptorrhynchites*, *Palaeocrassirhinus*, *Palaeocneorhinus* and *Sitonitellus* are known only from Lutetian. The richest fauna of Messel and Eckfelder Maar have not yet been described.

Bartonian localities (Figure 12) are Kutschlin (Czech Republic) with one species of the subfamily Molytinae and middle Eocene amber (with 140 species). Specimens in Baltic and Rovno amber are usually separate but an attempt has been Made to compare Baltic amber from individual localities, namely, from Scandinavia, Poland and the Kaliningrad Region. There are very few samples of weevis in Polish and Scandinavian amber. Five species (*Baltocyba electrinus*, *Toxorhynchus michalskii*, *Baltonanophyes crassirostre*, *Tachyerges hyperoche* and *Limalophus poinari*) were described from Polish and four species (*Archinvolvulus liquidus*, *Baltoconapium anderseni*, *Electrotribus henningseni* and *Ampharthropelma decipiens*) from Scandinavian amber were not found in Kaliningrad amber. The tribes Rhadinocybini and Notapionini from the Rhadinocybitae were found only in these ambers, respectively. However, there is no reason to consider these amber separate, since the common species (*Electrotribus theryi* and *Paonaupactus sitonitoides*) in Kaliningrad amber were found in Scandinavian and Polish ambers. The absence of species in Kaliningrad amber can be explained by their rarity. Together, 124 species from the families Nemonychidae, Anthribidae, Belidae, Rhynchitidae, Brentidae, Curculionidae, Platypodidae and Scolytidae are recorded fromBaltic amber. The fauna of Rovno amber with 16 species of Curculionoidea has no common species with other amber localities and the two most common species, *Electrotribus theryi* and *Paonaupactus sitonitoides*, were not found in Rovno amber. At the generic level, the fauna of Rovno amber is also quite separate since from 13 genera, only 7 genera are common with Baltic amber. All tribes (except Valenfriesiini) recorded in Rovno amber were also found in Baltic amber. Representatives of eight families were found in Rovno and Baltic amber (Figure 13). A detailed analysis of the faunas of Eocene ambers was carried out in other articles [71,191]. In Eocene amber are the first records of the subfamily Tesserocerinae, the supertribes Rhadinocybitae and Aspidapiitae, the tribes Mecocerini, Allandrini, Zygaenodini, Oxycraspedini, Piezotrachelini, Dorytomini, Plinthini, Acicnemidini, Stromboscerini, Dryotribini, Ellescini, Eugnomini, Rhamphini, Camarotini, Hyperini, Trachyphloeini, Anypotactini, Polydrusini, Hylastini, Hylurgini, Phloeosinini and Polygraphini and the last find of the Sayrevilleinae subfamily in the fossil record. The faunas of Bartonian are very different from the fauna of Lutetian. Common genera are absent.

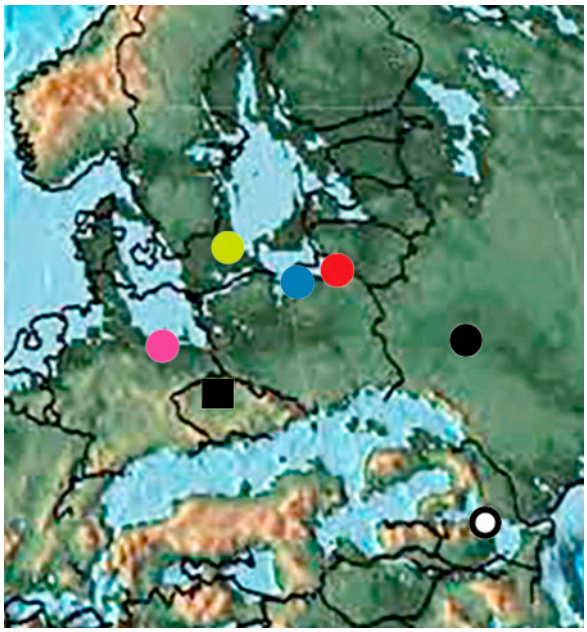

Figure 12. Bartonian Curculionoidea deposits: red circle—Baltic amber (Kaliningrad region); blue circle—Polish amber; yellow circle—Scandinavian amber; pink circle—Bitterfeld amber; ring—Romanian amber; circle—Rovno amber; square—Kutschlin.

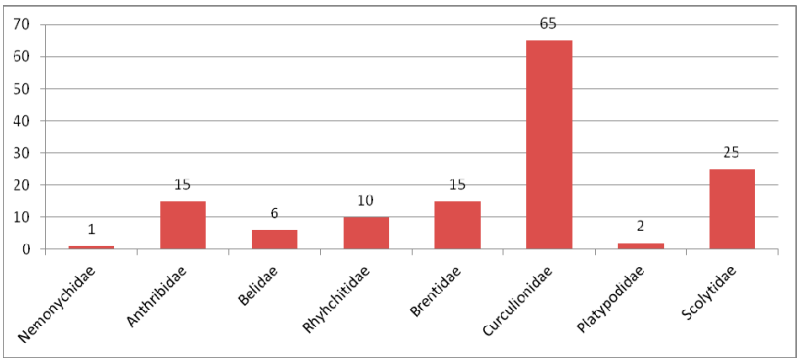

Figure 13. Composition of species of Curculionoidea in the Baltic amber.

In general, the weevil fauna of the middle Eocene of Europe is very distinct from earlier faunas. The connections between it and the North American Ypresian-Luthean faunas includethe subtribe Zherichinixenina of the tribe Metrioxenini and the genus *Limalophus*, in both of them. The similarity with the Ypresian and Paleocene faunas of Europe lies only in the presence of widespread groups at the level of tribes (Cryptorhynchini, Ceutorhynchini, Curculionini and Naupactini) and subfamilies (Anthribinae, Apioninae, Molytinae, Dryophthorinae, Cossoninae, Curculioninae).

3.2.5. Late Eocene Weevil Fauna

The Priabonian faunas are described from five localities (Figure 14), two in France (Celas and Ales-Monteils), one in the USA (Florissant), one in the south of the Russian Far East (Biamo) and one in Brazil (Fonseca). Some 184 species were described from these localities. One species of the tribe Hyperini was described from Biamo. The genus *Duartia*, probably related to Scolytidae, is known from Fonseca. *Palaeorhopalotria neli* was described from Ales-Monteils. This species belongs to the extinct tribe Palaeorhopalotriini belonging to the supertribe Allocorynitae now distributed in Central America [192] and also noted in the Miocene [193]. The three representatives of Entiminae and species from the tribe Corimaliini (earliest record) are known from Celas.

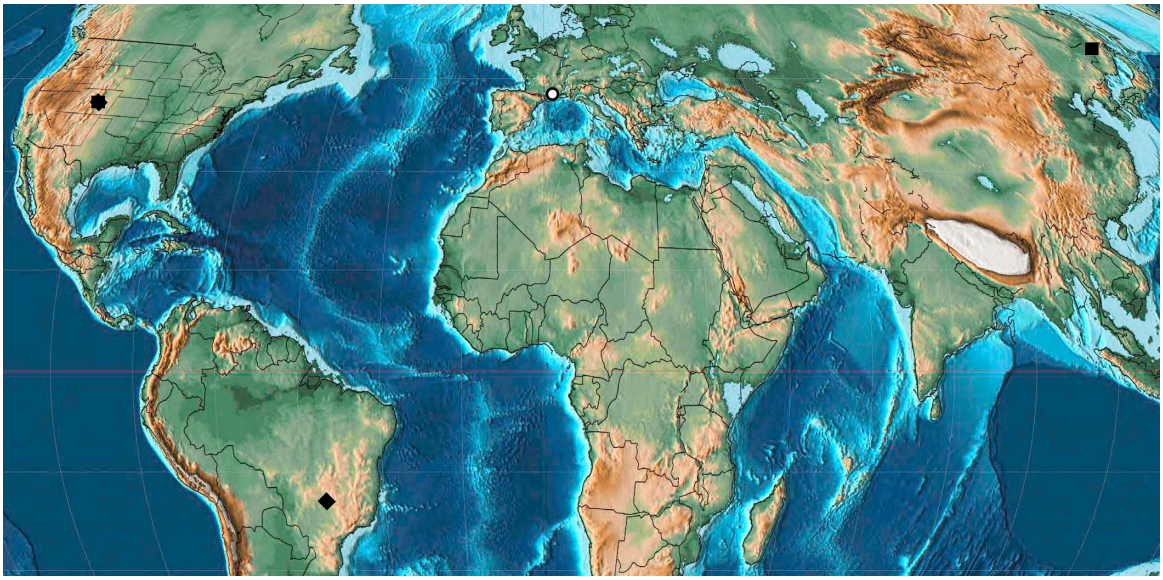

Figure 14. Priabonian Curculionoidea deposits: Circle—Celas and Ales-Monteils; octagon—Florissant; square—Biamo; rhombus—Fonseca.

The Florissant fauna, from which 177 species are known (Figure 15), is of great interest as being the richest of the Paleogene fauna. However, families Nemonychidae, Ithyceridae and Platypodidae are absent in this fauna. Representatives of the tribes Cratoparini, Anthribini, Ecelonerini, Tropiderini, Metrioxenini, Auletini, Rhynchitini, Eugnamptini (earliest record), Euscelini (earliest record), Apionini, Erirhinini, Dorytomini, Molytini, Magdalini (earliest record), Cryptorhynchini, Cleonini (earliest record), Dryophthorini, Sphenophorini (earliest record), Cossonini, Apostasimerini, Baridini, Ceutorhynchini, Cnemogonini (earliest record), Curculionini, Anthonomini, Rhamphini, Tychiini, Camarotini, Listroderini, Tropiphorini, Eudiagogini, Hyperini, Hormorini (earliest record), Naupactini, Geonemini, Psallidiini (earliest record), Tanymecini (earliest record), Hylastini and Phloeotribini (earliest record) are found in Florissant deposits (34.07 ± 0.10 Ma).

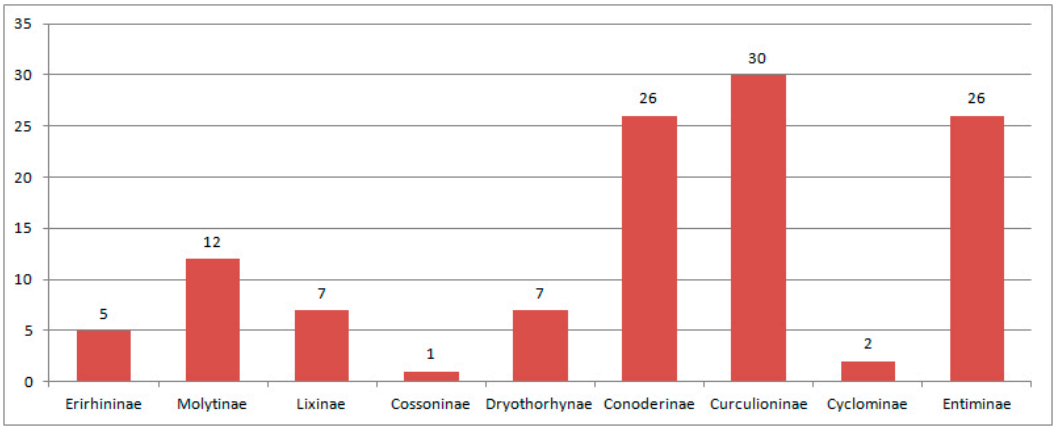

Figure 15. Composition of species of Curculionoidea in the Florissant.

About half (52%) of the genera are recent. This fauna of Florissant is very different from the fauna of Barton amber, where 70% of genera are extinct. The structure of the fauna is rather unusual (Figure 15). Curculionidae dominates but Rhynchitidae and Brentidae also play an important role. Three subfamilies (Curculioninae, Conoderinae and Entiminae) of the weevils form the basis of the fauna (Figure 16), while Curculioninae and Entiminae and Conoderinae do not play a significant role (Figure 17) in Baltic amber. It differs from the fauna of the Green River, where only Curculionidae

dominates and at the subfamily level of this family, the fauna is formed by Entiminae and Conoderinae. However, due to the presence of common groups (genera and tribes, usually found only in these localities), the Florissant fauna shows similarities primarily with the Green River (15 common genera and tribes) and Baltic and Rovno amber (11 common genera and tribes) faunas.

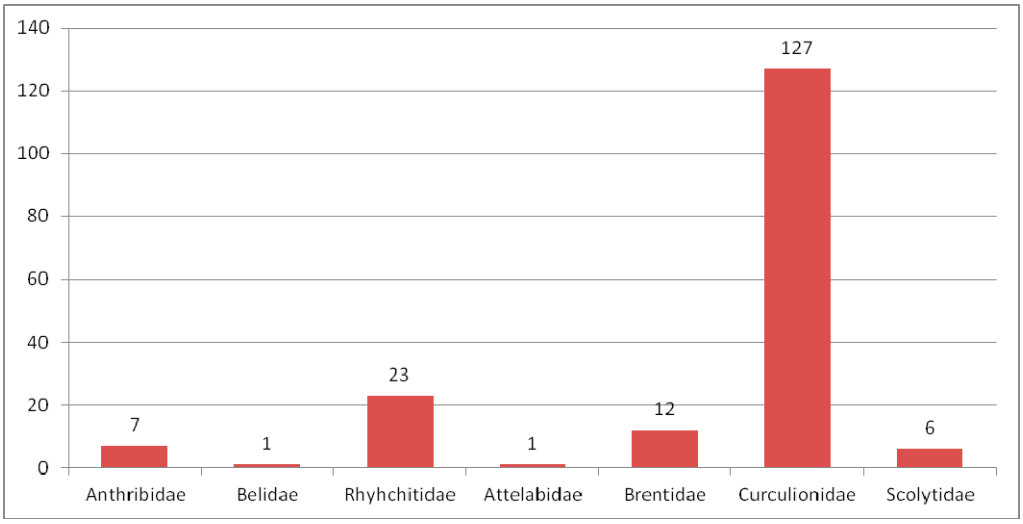

Figure 16. Composition of species of Curculionidae in the Florissant.

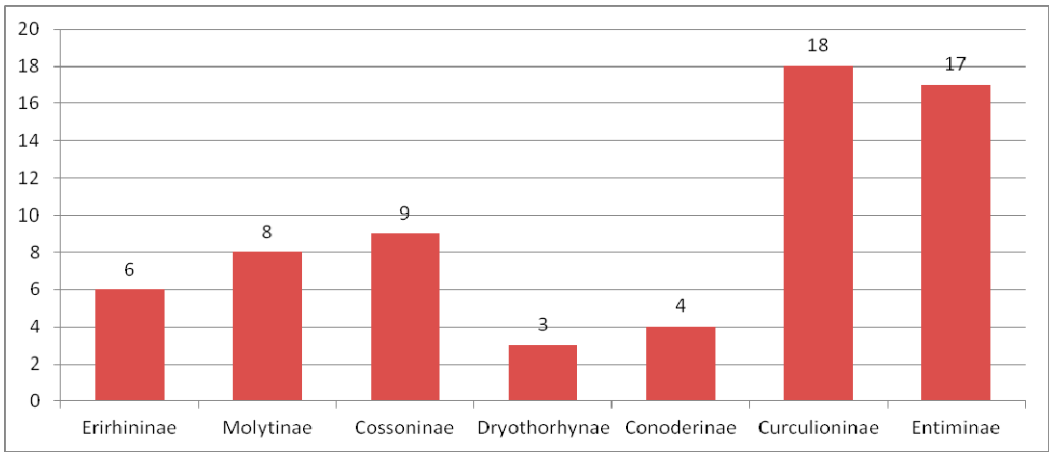

Figure 17. Composition of species of Curculionidae in the Baltic amber.

3.2.6. Comparison of the Eocene Weevil Faunas

In the Eocene, weevil diversity occurs from early to late (Figures 18 and 19). A small number of species in the Lutetian is due to poorly studied fauna. The number of representatives of modern genera increases towards the late Eocene.

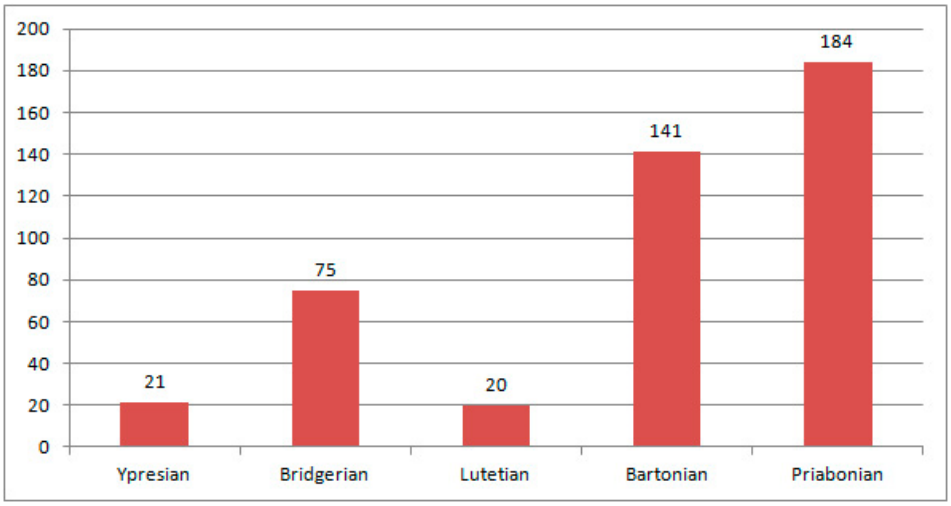

Figure 18. Change in the number of Curculionoidea species in the Eocene.

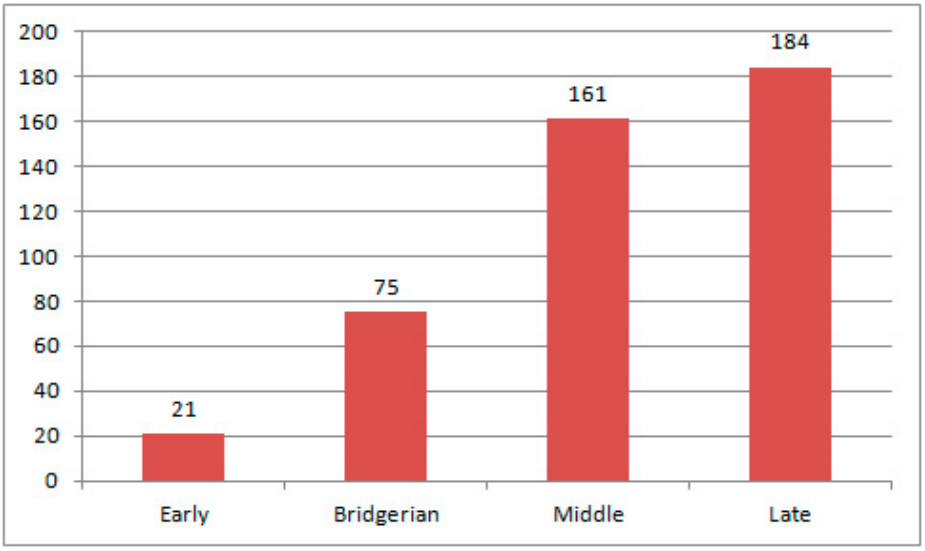

Figure 19. Change in the number of Curculionoidea species in the Eocene.

3.3. Oligocene Weevil Fauna

The Oligocene fauna of Curculionoid beetles is represented by 94 described species from six families. Ten localities related to the early (White River Badlands from USA, Brunnstatt and Corent from France), middle (border between early and late) (Sieblos and Kleinkembs from Germany, Gaube and Puy-Saint-Jean from France) and late Oligocene (Luzice from Czech Republic, Aix-en-Provance from France, Rott from Germany) (Figures 20 and 21), contain the remains of Curculionoidea that were described. The Greenland locality of Kap Dalton, where representative of the Nemonychidae family was described, dates from the Oligocene without specifying the stage [194]. Curculionoidea are also represented in the Rupelian Quilchena (Canada), Cereste (France), Seifhennersdorf (Germany), Ahuehuetes (Mexico), Kundratice (Czech Republic), Hutt Enspel (Germany), Ashutas (Kazakhstan), Perekishkyul' (Azerbaijan) localities [30,195–199].

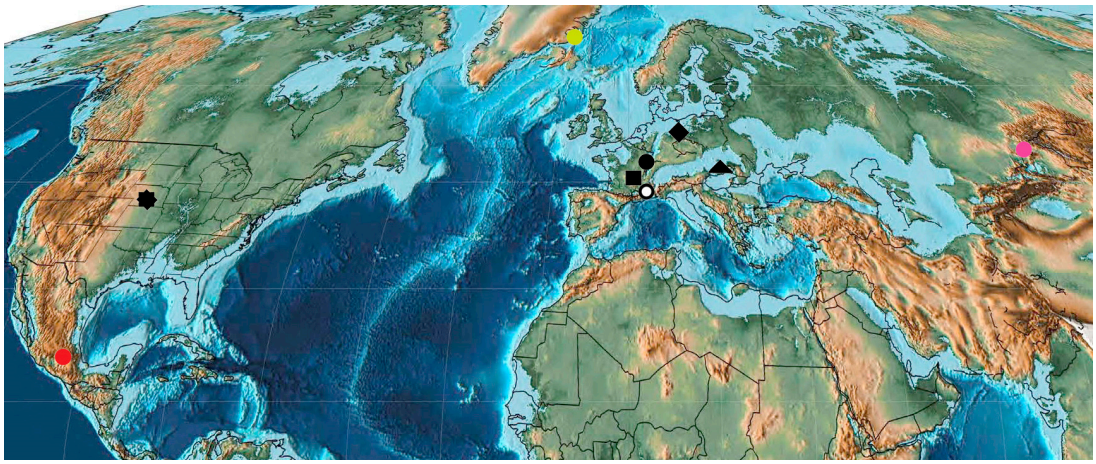

Figure 20. Rupelian Curculionoidea deposits: octagon—White River Badlands; circle—Brunnstatt; square—Corent; ring—Cereste; rhombus—Seifhennersdorf; red circle—Ahuehuetes; triangle—Kundratice; yellow circle—Kap Dalton; pink circle—Kenderlyk II.

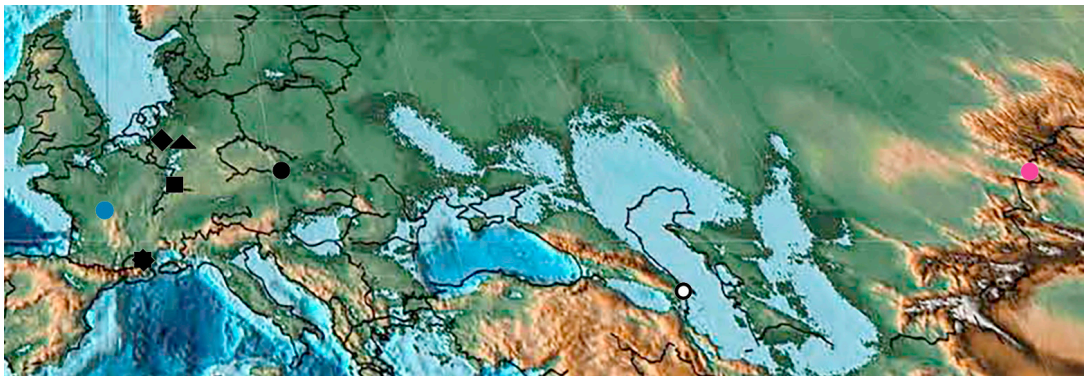

Figure 21. Middle and late Oligocene Curculionoidea deposits: circle—Luzice; rhombus—Rott and Enspel; octagon—Aix-en-Provance; pink circle—Ashutas; ring—Perekishkyul'; triangle—Sieblos; square—Kleinkembs; blue circle—Gaube and Puy-Saint-Jean.

Representatives of the family Curculionidae and a few species of the subfamily Apioninae from the family Brentidae were found in these localities.

3.3.1. Review of Curculionoidea Families in the Oligocene

Nemonychidae in the Oligocene

The family Nemonychidae in the Oligocene is represented by one species assigned to the tribe Eocaenonemonychini from the subfamily Cretonemonychinae. This is the latest find of the family in the fossil record.

Anthribidae in the Oligocene

The family Anthribidae is very poorly represented in Oligocene deposits (Figure 22). No representatives of the subfamily Anthribinae were found. One species of the tribe Choragini was described from the late Oligocene. Choraginae were very rare in the Eocene, so this find shows a greater abundance of this subfamily in the Oligocene. Three species of the genus *Bruchela* of the subfamily Urodontinae were described from the Oligocene of France and Germany. This is the first reliable indication of Urodontinae in the fossil record.

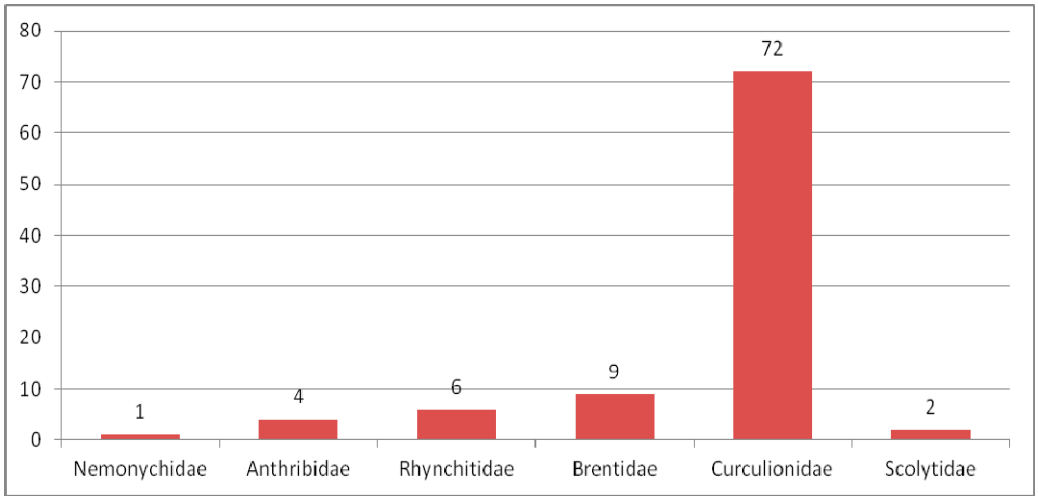

Figure 22. Composition of species of Curculionoidea in the Oligocene.

Rhynchitidae in the Oligocene

Six species of the family Rhynchitidae occur in the late Oligocene. The extinct genus of the tribe Vossicartini, now distributed only in tropical Africa and Madagascar [60], is the only find of this tribe in the fossil record. The tribe Rhynchitini is represented by extinct species of recent genera belonging to both the primitive subtribe Perrhynchitina and the advanced subtribe Rhynchitina.

Attelabidae in the Oligocene

The Attelabidae family was not found in the Oligocene.

Brentidae in the Oligocene

The family Brentidae is found in the Oligocene of Europe. Eight species belong to the subfamily Apioninae and one to the subfamily Nanophyinae (tribe Nanophyini). The systematic position of most species in the tribes and genera requires clarification. One species can be assigned to the genus *Perapion* of the tribe Aplemonini. Previously, this genus was discovered in the Paleocene of Europe and the Eocene of North America.

Curculionidae in the Oligocene

The Curculionidae family is represented by 72 species from the subfamilies Erirhininae, Molytinae, Lixinae, Dryophthorinae, Cossoninae, Conoderinae, Curculioninae and Entiminae (Figure 23). Only the subfamily Cyclominae was not encounteredin Oligocene deposits. Two species from the tribes Erirhinini and Bagoini of the subfamily Erirhininae are noted in the Oligocene. Representatives of the tribes Molytini, Pissodini, Magdalini and Cryptorhynchini belonging to the subfamily Molytinae were described from different Oligocene localities. *Lithopissodes luschitzensis* is the only Pissodini in the fossil record. Two species of the genus *Larinus* of the tribe Lixini and two species formally assigned to the genus *Cleonis* belong to the subfamily Lixinae. The subfamily Dryophthorinae with one species of the tribe Dryophthorini and one species of the tribe Sphenophorini is known from the late Oligocene. Here is the only record of the tribe Sphenophorini in the Paleogene of Europe. Only two species from the tribes Rhyncolini and Cossonini of the subfamily Cossoninae were found in the late Oligocene. It is important to note that the tribe Dryotribini common in the middle Eocene amber are not found in the Oligocene. The diverse subfamily Conoderinae is poorly represented in the Oligocene. Two species of Bariditae are noted. *Lithogeraeus comminute* from the tribe Apostasimerini was described from the early Oligocene of the United States. One species placed in the genus *Baris* of the tribe Baridini is known from the early Oligocene of Europe. The supertribe Conoderintae is not found in the

Oligocene. The supertribe Ceutorhynchitae is represented by the tribes Ceutorhynchini and Phytobiini. The tribes Smicronychini, Anthonomini and Tychiini from the subfamily Curculioninae are found in the Oligocene. "*Smicronyx*" *antiquus* is the only species of the tribe Smicronychini in the fossil record. "*Anthonomus*" *soporus* from the tribe Anthonomini is Marked for the early Oligocene of the United States. The Oligocene species of the genera *Sibinia* and *Tychius* belong to the tribe Tychiini. Twenty three species from six tribes belong to the subfamily Entiminae. The most diverse tribes are Tropiphorini with 7 species and Tanymecini with 6 species. One or two species belong to the tribes Sciaphilini, Sitonini, Geonemini and Brachyderini. The position of four species in these tribes requires clarification. The family Platypodidae is not found in the Oligocene. Two species of the genus *Hylesinus* of the tribe Hylesinini from the family Scolytidae are known from the late Oligocene of France.

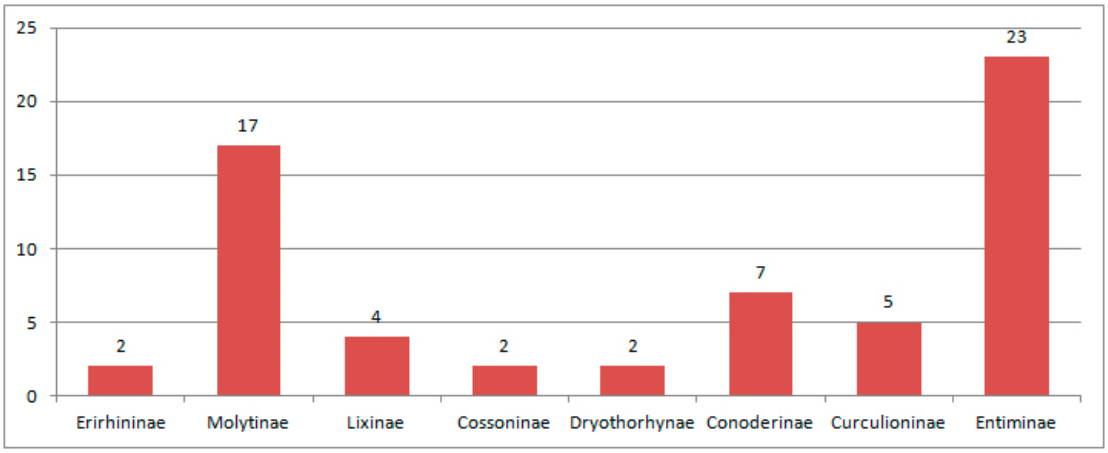

Figure 23. Composition of species of Curculionidae in the Oligocene.

Localities with the described fauna are divided into those located in North America and Europe. Curculionidae from the only Asian locality in Kazakhstan have not yet been described. Species were described from the White River Badlands and Kap Dalton in Greenland. Their fauna is radically different from the fauna of the Old World. At least 13 species of the family Curculionidae are known from the White River Badlands. These are representatives of the genera *Procas*, *Archaeoheilus*, *Lithogeraeus*, *Anthonomus*, *Limalophus*, *Mitostylus* and *Epicaerus*. None of these genera were found in the Oligocene of Europe. The fauna of this locality shows a close similarity with the fauna of the middle Eocene, Green River and Road Mountain. Moreover, three species from the White River are found inthese faunas. At the level of genera and tribes, the similarity between them is complete. One can consider White River as a reduced version of the Eocene American faunas. The only Curculionoidea from the Oligocene of Greenland belongs to the North American tribe Eocaenonemonychini and possibly to a genus described from the Green River.

3.3.2. Early Oligocene Weevil Fauna

Twenty one species are found in the early Oligocene of Europe (France), 13 species in Brunnstatt and 8 species in Corent. There is one species of the subfamily Urodintinae (Anthribidae), three species of the subfamily Apioninae (Brentidae), 17 species of Curculionidae (one species of the subfamily Erirhininae, five species of the subfamily Molytinae, three species of the subfamily Lixinae, four species of the subfamily Conoderinae, two species of the subfamily Curculioninae, one species of the subfamily Entiminae and one species of the subfamily insertae sedis). The faunas of Brunnstatt and Corent are very different. No species and genera occur in both localities. Three species in Corent can be attributed to the meadow complex (*Anisorhynchus* and Cleonini) and three to the forest complex (representatives of Molytinae). The fauna of Brunnstatt is much more diverse. Most species noted there belong to the meadow-steppe complex (11 species from the genera *Bruchela*, *Larinus*, *Baris*, *Ceutrhynchus*, *Smicronyx*,

Tychius and the subfamily Apioninae) while Molytinae probably belonged to the forest complex and *Bagous* to the near-water habitat.

3.3.3. Middle Oligocene Weevil Fauna

Only ten weevil species were described from the middle Oligocene (boundaries are of the early and late Oligocene) and six of them belong to Curculionidae insertae sedis. The rest belong to the subfamilies Molytinae, Conoderinae and Curculioninae of the family Curculionidae.

3.3.4. Late Oligocene Weevil Fauna

Thirty four species were described from the late Oligocene. One species is known from Luzice, 22 from Aix-en-Provance and 27 from Rott. The fauna of Aix-en-Provance is represented by the three families, Brentidae, Curculionidae and Scolytidae (Figure 24). They involveforest species (*Dryophthorus incertus*, *Cossonus robustus*, *Rhytidoderes* spp., *Hylesinus* spp.) and open space species (Apioninae, "*Sibinia*" *whitneyi*), *Protainophthalmus* spp. Extinct species belong to widespread groups. Noteworthy are six species of the extinct genus *Protainophthalmus* known only from this locality. This genus belongs to the subtribe Tainophthalmina that is distributed in Central and East Asia and is also found in the Mediterranean. Three extinct species of the recent genus *Rhytideres* from the Mediterranean are also only found in Aix-en-Provance. The families Anthribidae, Rhynchitidae, Brentidae and Curculionidae form the Rott fauna (Figure 25). Species of the family Curculionidae dominate. Most species belong to widespread genera (*Choragus*, *Perapion*, *Nanophyes*, *Hylobius*, *Magdalis*, *Acalles*, *Larinus*, *Sphenophorus*, *Rhyncolus*, *Ceutorhynchus* and *Tychius*). Three species belong to the West Palaearctic genera *Bruchela* and *Tatianaerhynchites*. Representatives of the oriental genera *Cartorhynchites* and *Opacoinvolvulus* are also present. The two genera *Germanocartus* and *Brachymycterus* are endemic to this locality. The Rott fauna consisted of approximately half forest and meadow species. It is obviousthat the Rott fauna is much more diverse than that of Aix-en-Provance. Common genera are absent.

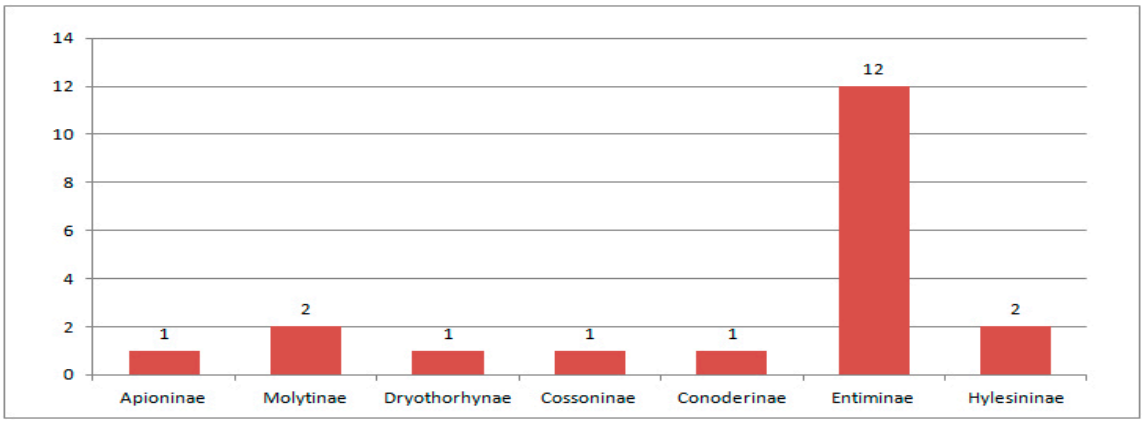

Figure 24. Composition of species of Curculionoidea in Aix-en-Provance.

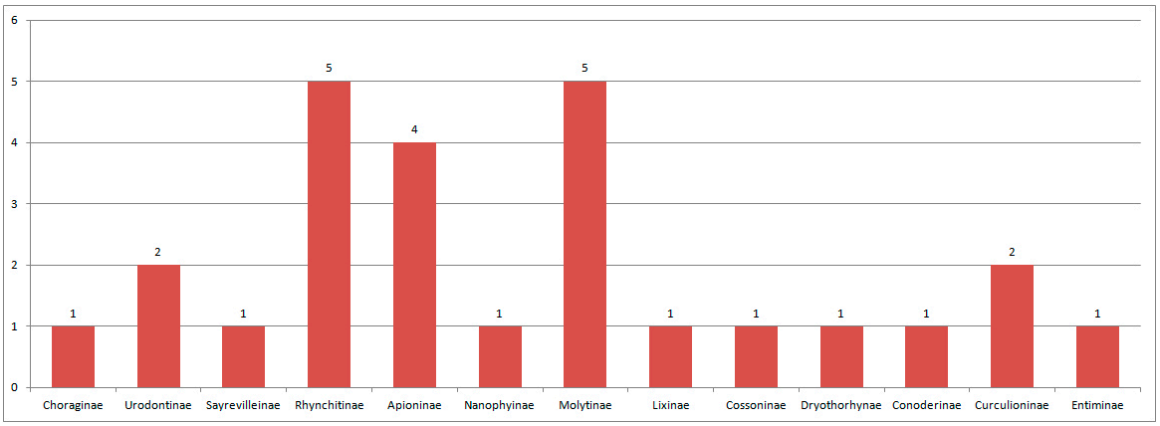

Figure 25. Composition of species of Curculionoidea in Rott.

3.3.5. Comparing of the Oligocene Weevil Faunas

Comparing the faunas of the early and late Oligocene, it is noted that the Chattian faunas are more diverse. They contain not only representatives of widespread or West Palaearctic genera but also oriental forms. Relationships with the African fauna are indicated the presence of a representative of the tribe Vossicartini. In general, the Oligocene fauna was formed by forest and meadow-steppe species, which indicates the presence of open spaces.

4. Discussion

In total, 564 species of Curculionoidea from nine families were described from the Paleogene. They occur in seven localities in North America (four from Eocene and three from Oligocene), three in South America (one from the Paleocene and two from the Eocene), 34 in Europe (two from the Paleocene, 18 from the Eocene and 14 from the Oligocene) and six in North and East Asia (two from each of the Paleocene, the Eocene and the Oligocene). They have not yet been found in African, South Asian and Australian Paleogene localities. An increase in the number of species is observed from the Paleocene to the Eocene (end of the Eocene) and then decreases in the Oligocene (Figure 26). The greatest diversity of Curculionoidea is described from the Eocene of Europe and North America. The richest faunas are known from the terminal Eocene of Florissant (177 species), the middle Eocene Baltic amber (124 species) and the early-middle Eocene Green River formation (75 species). Discovery of relict groups with a local distribution in the contemporary fauna, such as Ithyceridae—Chilecarinae and Ithycerinae, Belidae—Metrioxenini, Rhynchitinae—Sayrevilleinae, were Made in the Eocene of America and the Eocene and Oligocene of Europe. The most numerous group of all the Paleogene Coleoptera faunas is the superfamily Curculionoidea [200]. The family Curculionidae dominates in all localities of the Paleogene. Anthribidae, Rhynchitidae, Brentidae and Scolytidae are sometimes subdominant in Eocene localities. For example, Anthribidae, Brentidae and Scolytidae account for 40% of the Baltic amber fauna (weevils 47%) and Rhynchitidae comprise 13% of the Florissant fauna (weevils 72%). In all localities, species associated with woody vegetation dominate. Species associated with herbaceous vegetation are present in most localities since the middle Paleocene. Their proportion is increasing in the Oligocene. Further study of the Curculionoidea from Paleogene localities May clarify the picture somewhat.

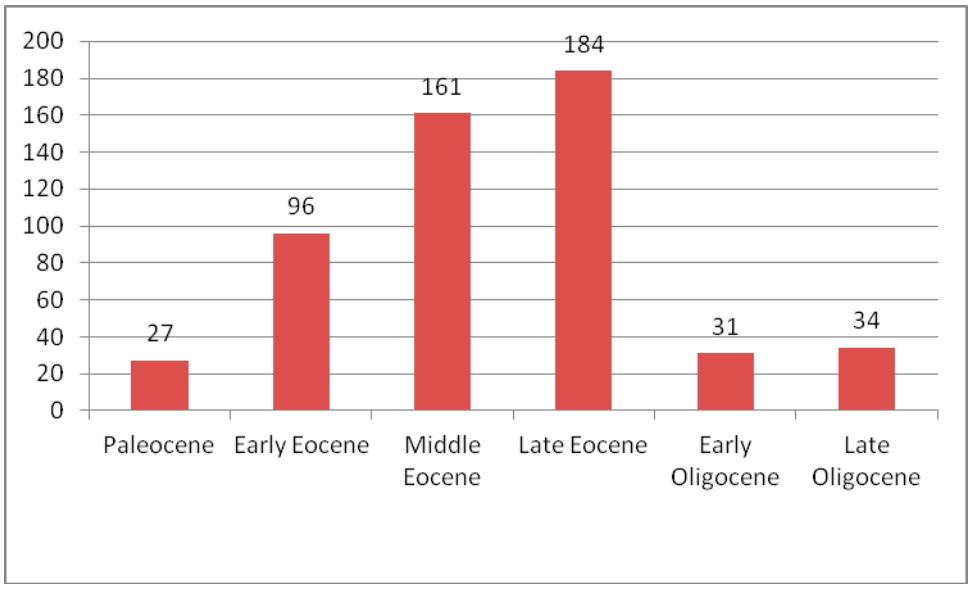

Figure 26. Change in number of Curculionoidea species in the Paleogene subepochs. The fauna of the Green River Formation is included in the Early Eocene.

Funding: The study was partially supported by the Russian Foundation for Basic Research (project nos. 18-04-00243-a and 19-04-00465-a) and the Federal Fundamental Scientific Research Program for 2013–2020 (project no. AAAA-A16-116121410121-7).

Acknowledgments: The author thanks Many colleagues for their assistance throughout his studies: V.I. Alekseev, A.R. Manukyan and A.V. Smirnova (Kaliningrad Regional Amber Museum, Russia: Kaliningrad), A. Allen (USA: Boise), A. Bukejs (Institute of Life Sciences and Technologies, Daugavpils University, Latvia: Daugavpils), D. Berthet (Centre de Conservation du musée des confluences, France, Lyon), J. Damzen (Lithuania: Vilnius), F. Eichmann (Germany: Hannover), A. Górski (Poland: Bielsko-Biaùa), C. Gröhn (Germany: Glinde), V.A. Gusakov (Russia: Moscow), A.G. Kirejtshuk (Zoological Institute RAS, Russia: St. Petersburg), U. Kotthoff (Center of Natural History, Germany: Hamburg), N.V. Martynovich (Museum of the World Ocean, Russia: Kaliningrad), A. Nel (Muséum national d'histoire naturelle, France: Paris), E.E. Perkovsky and V.Y. Nazarenko (Schmalhausen Institute of Zoology, NASU, Ukraine: Kiev), A.G. Ponomarenko, A.P. Rasnitsyn, E.D. Lukashevich, D.E. Shcherbakov, I.D. Sukatsheva, D.V. Vassilenko (Borissiak Paleontological Institute RAS, Russia: Moscow), E. Yu. Shevnin (Russia: Novosibirsk), L.B. Vilhelmsen (Zoological Museum, University of Copenhagen, Denmark: Copenhagen), K. Szczepaniak (Earth Institute, Poland: Warsaw), T. Wappler (Hessisches Landesmuseum Darmstadt, Germany: Darmstadt), Ch. R. Scotese (Northwestern University, USA: Evanston) allowing me to use his paleomaps and G.O. Poinar, Jr (Oregon State University, USA: Corvallis) for improving the Manuscript. The two reviewers are also acknowledged for the valuable comments that improved the manuscript.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Scotese, C.R. Atlas of Paleogene Paleogeographic Maps (Mollweide Projection), Maps 8–15, Volume 1, The Cenozoic, PALEOMAP Atlas for ArcGIS, PALEOMAP Project, Evanston, IL. 2014. Available online: https://www.researchgate.net/publication/267569784_Atlas_of_Paleogene_Paleogeographic_Maps_Mollweide_Projection_Maps_8-15_Volume_1_The_Cenozoic_PALEOMAP_Atlas_for_ArcGIS_PALEOMAP_Project_Evanston_IL (accessed on 6 September 2020).
2. Blythe, A.E.; Kleinspehn, K.L. Tectonically versus climatically driven Cenozoic exhumation of the Eurasian plate Margin, Svalbard: Fission track analyses. *Tectonics* **1998**, *17*, 621–639. [CrossRef]
3. Nel, A. The oldest bee fly in the French Paleocene (Diptera: Bombyliidae). *C.R.Palevol* **2008**, *7*, 401–405. [CrossRef]
4. Wappler, T.; Currano, E.D.; Wilf, P.; Rust, J.; Labandeira, C.C. No post-Cretaceous ecosystem depression in European forests? Rich insect feeding damage on diverse middle Palaeocene plants, Menat, France. *Proc. R. Soc. B: Biol. Sci.* **2009**, *276*, 4271–4277. [CrossRef] [PubMed]

5. Dyke, G.; Lindow, B. Taphonomy and abundance of birds from the Lower Eocene Fur Formation of Denmark. *Geol. J.* **2009**, *44*, 365–373. [CrossRef]
6. Friedman, M.; Beckett, H.T.; Close, R.A.; Johanson, Z. The English Chalk and London Clay: Two remarkable British bony fish Lagerstätten. *Geolog. Soc., London, Special Publ.* **2015**, *430*, 165–200. [CrossRef]
7. Smith, M.E.; Singer, B.; Carroll, A. 40Ar/39Ar geochronology of the Eocene Green River Formation, Wyoming. *GSA Bull.* **2003**, *115*, 549–565. [CrossRef]
8. Kirejtshuk, A.G.; Legalov, A.A.; Nel, A. A new genus of the subfamily Apioninae (Coleoptera: Brentidae) from the Lower Eocene Oise amber. *Paleontol. J.* **2015**, *49*, 1436–1441. [CrossRef]
9. Wilf, P.; Singer, B.S.; Zamaloa, M.C.; Johnson, K.R.; Cúneo, N.R. Early Eocene 40Ar/39Ar age for the Pampa de Jones plant, frog and insect biota (Huitrera Formation, Neuquén Province, Patagonia, Argentina). *Ameghiniana* **2010**, *47*, 207–216. [CrossRef]
10. Mathewes, R.W.; Greenwood, D.R.; Archibald, S.B. Paleoenvironment of the Quilchena flora, British Columbia, during the Early Eocene Climatic Optimum. *Can. J. Earth Sci.* **2016**, *53*, 1–17. [CrossRef]
11. Mustoe, G.E. Geologic history of Eocene Stonerose Fossil Beds, Republic, Washington, USA. *Geosciences* **2015**, *5*, 243–263. [CrossRef]
12. Lenz, O.K.; Wilde, M.; Mertz, D.F.; Riegel, W. New palynology-based astronomical and revised 40Ar/39Ar ages for the Eocene Maar lake of Messel (Germany). *Int. J. Earth. Sci.* **2015**, *104*, 873–889. [CrossRef]
13. West, I.M. The Eocene Cliffs of Bournemouth Dorset. Geology of the Wessex Coast. Available online: www.southampton.ac.uk/~{}imw/Bournemouth-Geology.htm (accessed on 9 July 2016).
14. Ring, S.J.; Bocherens, H.; Wings, O.; Rabi, M. Divergent Mammalian body size in a stable Eocene greenhouse climate. *Sci. Rep.* **2020**, *10*, 3987. [CrossRef] [PubMed]
15. Sachse, M. A remarkable fossiliferous Mass flow deposit in the Eocene Eckfeld Maar (Germany)—Sedimentological, taphonomical and palaeoecological considerations. *Facies* **2005**, *51*, 173–184. [CrossRef]
16. Evanoff, E.; McIntosh, W.C.; Murphey, P.C. Stratigraphic summary and 40Ar/39Ar geochronology of the Florissant Formation, Colorado. *Denver Mus. Nat. Sci. Proc.* **2001**, *4*, 1–16.
17. Scott, J.W.; Bowring, S.A. High Precision U/Pb Geochronology of Oligocene Tuffs from the White River Formation, Douglas, Wyoming. *J. Vertebr. Paleontol.* **2000**, *20*, 69A.
18. Walther, H.; Kvaček, Z. Early Oligocene flora of Seifhennersdorf (Saxony). *Acta Mus. Nat. Pragae, B, Hist. Nat.* **2007**, *63*, 85–174.
19. Schindler, T.; Wuttke, M. Geology and limnology of the Enspel Formation (Chattian, Oligocene; Westerwald, Germany). *Palaeobiodiversity Palaeoenvironments* **2010**, *90*, 21–27. [CrossRef]
20. Petrulevičius, J.F.; Wappler, T.; Nel, A.; Rust, J. The diversity of Odonata and their endophytic ovipositions from the Upper Oligocene Fossillagerstätte of Rott (Rhineland, Germany). *ZooKeys* **2011**, *130*, 67–89. [CrossRef]
21. Gaudant, J.; Nel, A.; Nury, D.; Véran, M.; Carnevale, G. The uppermost Oligocene of Aix-en-Provence (Bouches-du-Rhône, Southern France): A Cenozoic brackish subtropical Konservat-Lagerstätte, with fishes, insects and plants. *C.R.Palevol* **2018**, *17*, 460–478. [CrossRef]
22. Seyfullah, L.J.; Beimforde, C.; Dal Corso, J.; Perrichot, V.; Rikkinen, J.; Schmidt, A.R. Production and preservation of resins—Past and present. *Biol. Rev.* **2018**, *93*, 1684–1714. [CrossRef]
23. Bukejs, A.; Alekseev, V.I.; Pollock, D.A. Waidelotinae, a new subfamily of Pyrochroidae (Coleoptera: Tenebrionoidea) fromBaltic amber of the Sambian peninsula and the interpretation of Sambian amber stratigraphy, age and location. *Zootaxa* **2019**, *4664*, 261–273. [CrossRef] [PubMed]
24. Thompson, R.T. Observations on the morphology and classification of weevils (Coleoptera, Curculionoidea) with a key to Major groups. *J. Nat. Hist.* **1992**, *26*, 835–891. [CrossRef]
25. Kuschel, G. A phylogenetic classification of Curculionoidea to families and subfamilies. *Mem. Entomol. Soc. Wash.* **1995**, *14*, 5–33.
26. Alonso-Zarazaga, M.A.; Lyal, C.H.C. *A world catalogue of families and genera Curculionoidea (Insecta: Coleoptera) (excepting Scolytidae and Platypodidae)*; Entomopraxis: Barcelona, Spain, 1999; p. 315.
27. Oberprieler, R.G.; Marvaldi, A.E.; Anderson, R.S. Weevils, weevils, weevils everywhere. *Zootaxa* **2007**, *1668*, 491–520. [CrossRef]

28. Oberprieler, R.G.; Anderson, R.S.; Marvaldi, A.E. Curculionoidea Latreille, 1802: Introduction, Phylogeny. In *Handbook of Zoology. Arthropoda: Insecta*; Coleoptera, Beetles. Volume 3: Morphology and Systematics (Phytophaga); Leschen, R.A.B., Beutel, R.G., Eds.; Walter de Gruyter: Berlin, Germany; New York, NY, USA, 2014; pp. 285–300.
29. Gratshev, V.G.; Legalov, A.A. The Mesozoic stage of evolution of the family Nemonychidae (Coleoptera, Curculionoidea). *Paleontol. J.* **2014**, *48*, 851–944. [CrossRef]
30. Legalov, A.A. Fossil Mesozoic and Cenozoic weevils (Coleoptera, Obrienioidea, Curculionoidea). *Paleontol. J.* **2015**, *49*, 1442–1513. [CrossRef]
31. Zherichin, V.V.; Gratshev, V.G. Obrieniidae, fam. nov., the oldest Mesozoic weevils (Coleoptera, Curculionoidea). *Paleontol. J.* **1993**, *27*, 50–69.
32. Bouchard, P.; Bousquet, Y.; Davies, A.E.; Alonso-Zarazaga, M.A.; Lawrence, J.F.; Lyal, C.H.C.; Newton, A.F.; Reid, C.A.M.; Schmitt, M.; Slipiński, S.A.; et al. Family group names in Coleoptera (Insecta). *Zookeys* **2001**, *88*, 1–972. [CrossRef]
33. Legalov, A.A. New Obrieniidae from the Jurassic of Kazakhstan (Coleoptera, Obrienioidea). *Paleontol. J.* **2012**, *46*, 73–78. [CrossRef]
34. Wood, S.L. A reclasification of the genera of Scolytidae (Coleoptera). *Great Basin Nat. Mem.* **1986**, *10*, 1–126.
35. Sanborne, M. Biology of *Ithycerus noveboracensis* (Forster) (Coleoptera) and weevil phylogeny. *Evol. Monogr.* **1981**, *4*, 1–80.
36. Marvaldi, A.E.; Sequeira, A.S.; O'Brien, C.W.; Farrell, B.D. Molecular and morphological phylogenetics of weevils (Coleoptera: Curculionoidea): Do niche shifts accompany diversification? *Syst. biol.* **2002**, *51*, 761–785. [CrossRef] [PubMed]
37. Legalov, A.A. Contribution to the knowledge of the family Nemonychidae (Coleoptera) with descriptions of new taxa. *Ukr. J. Ecol.* **2017**, *7*, 64–87. [CrossRef]
38. Legalov, A.A. Annotated key to weevils of the world. Part 1. Families Nemonychidae, Anthribidae, Belidae, Ithyceridae, Rhynchitidae, Brachyceridae and Brentidae. *Ukr. J. Ecol.* **2018**, *8*, 780–831. [CrossRef]
39. Legalov, A.A. Annotated key to weevils of the world. Part 2. Subfamily Molytinae (Coleoptera, Curculionidae). *Ukr. J. Ecol.* **2018**, *8*, 340–350.
40. Legalov, A.A. Annotated key to weevils of the world. Part 3. Subfamily Conoderinae (Coleoptera, Curculionidae). *Ukr. J. Ecol.* **2018**, *8*, 494–503.
41. Legalov, A.A. Annotated key to weevils of the world. Part 4. Subfamilies Erirhininae, Dryophthorinae and Cossoninae (Curculionidae). *Ukr. J. Ecol.* **2020**, *10*, 319–331. [CrossRef]
42. Legalov, A.A. Annotated key to weevils of the world. Part 5. Subfamily Entiminae (Curculionidae). *Ukr. J. Ecol.* **2020**, *10*, 332–346. [CrossRef]
43. Kuschel, G. The Nearctic Nemonychidae (Coleoptera, Curculionoidea). *Entomol. Scand.* **1989**, *20*, 121–171. [CrossRef]
44. Seunggwan, S.; Clarke, D.J.; Lemmon, A.R.; Lemmon, E.M.; Aitken, A.L.; Haddad, S.; Farrell, B.D.; Marvaldi, A.E.; Oberprieler, R.G.; McKenna, D.D. Phylogenomic data yield new and robust insights into the phylogeny and evolution of weevils. *Mol. Biol. Evol.* **2018**, *35*, 823–836. [CrossRef]
45. Rheinheimer, J. Illustrierter Katalog und Bibliographie der Anthribidae der Welt (Insecta: Coleoptera). *Mitt. Entomol. Ver. Stuttg.* **2004**, *39*, 1–288.
46. Gratshev, V.G.; Legalov, A.A. New Mesozoic Ithyceridae beetles (Coleoptera). *Paleontol. J.* **2011**, *45*, 76–81. [CrossRef]
47. Legalov, A.A. New and little known weevils (Coleoptera: Curculionoidea) from the Paleogene and Neogene. *Hist. Biol.* **2013**, *25*, 59–80. [CrossRef]
48. Legalov, A.A.; Poinar, G., Jr. New tribes of the superfamily Curculionoidea (Coleoptera) in Burmese amber. *Hist. Biol.* **2015**, *27*, 558–564. [CrossRef]
49. Poinar, G., Jr.; Brown, A.E.; Legalov, A.A. A new weevil tribe, Mekorhamphini trib. nov. (Coleoptera, Ithyceridae) with two new genera in Burmese amber. *Ukr. J. Ecol.* **2016**, *6*, 157–163. [CrossRef]
50. Legalov, A.A.; Nel, A.; Kirejtshuk, A.G. New and little known weevils (Coleoptera: Curculionoidea) from the Paleocene of Menat (France). *C.R. Palevol.* **2017**, *16*, 248–256. [CrossRef]
51. Poinar, G.O., Jr.; Brown, A.E.; Legalov, A.A. A new weevil, *Periosomerus tanyorhynchus* gen. et sp. nov. (Coleoptera; Ithyceridae) in mid-Cretaceous Burmese amber. *Cret. Res.* **2019**, *104*, 104195. [CrossRef]

52. Zimmerman, E.C. *Australian Weevils (Coleoptera. Curculionoidea). I. Anthribidae to Attelabidae*; CSIRO Publishing: Melbourne, Australia, 1994.
53. Hamilton, R.W. Taxanomic use of endophallic structures in some Attelabidae and Rhynchitidae of America, North of Mexico (Coleoptera: Curculionoidea), with notes on nomenclature. *Ann. Entomol. Soc. America.* **1979**, *72*, 29–34. [CrossRef]
54. Sawada, Y. A systematic study of the family Rhynchitidae of Japan (Coleoptera, Curculionoidea). *Hum. Nat.* **1993**, *2*, 1–93.
55. Legalov, A.A. Taxonomy, classification and phylogeny of the leaf-rolling weevils (Coleoptera: Rhynchitidae, Attelabidae) of the world fauna. *Novosib. CD-R* **2003**. № 0320301200.
56. Legalov, A.A. Reconstruction of phylogeny in leaf-rolling weevils (Coleoptera, Rhynchitidae, Attelabidae) using the Synap method. Report 1. *Zool. Zhurnal.* **2004**, *83*, 1427–1432.
57. Legalov, A.A. Reconstruction of phylogeny in leaf-rolling weevils (Coleoptera, Rhynchitidae, Attelabidae) using the SYNAP method. Report 2. *Zool. Zhurnal.* **2005**, *84*, 190–194.
58. Legalov, A.A. Trophic relations of leaf-rolling weevils (Coleoptera, Rhynchitidae, Attelabidae). *Zool. Zhurnal.* **2005**, *84*, 352–361.
59. Legalov, A.A. Phylogenetic reconstruction of weevils superfamily Curculionoidea (Coleoptera) using the SYNAP method. *Biol. Bull.* **2006**, *33*, 127–134. [CrossRef]
60. Legalov, A.A. *Leaf-Rolling Weevils (Coleoptera: Rhynchitidae, Attelabidae) of the World Fauna*; Agro-Siberia: Novosibirsk, Russia, 2007.
61. Legalov, A.A. The family Rhynchitidae (Insecta: Coleoptera) in the Himalayas. *Biodiversitäd und Nat. im Himalaya* **2015**, *5*, 479–486.
62. Zimmerman, E.C. *Australian Weevils (Coleoptera. Curculionoidea). III. Nanophyidae, Rhynchophoridae, Erirhinidae, Curculionidae: Amycterinae, Literature Consulted*; CSIRO Publications: Melbourne, Australia, 1993.
63. Zimmerman, E.C. *Australian Weevils (Coleoptera. Curculionoidea). II. Brentidae, Eurhynchidae, Apionidae and a Chapter on Immature Stages by Brenda May*; CSIRO Publications: Melbourne, Australia, 1994.
64. Wanat, M. *Genera of Australo-Pacific Rhadinocybinae and Myrmacicelinae, with Biogeography of the Apionidae (Coleoptera: Curculionoidea) and Phylogeny of the Brentidae (s. lato)*; Mantis: Olsztyn, Poland, 2001.
65. Zherikhin, V.V.; Egorov, A.B. *Weevils (Coleoptera, Curculionidae) from Russian Far East*; Institute Biology Soil Science: Vladivostok, Russia, 1991.
66. Morimoto, K.; Kojima, H. Systematic position of the tribe Phylloplatypodini, with remarks on the definitions of the families Scolytidae, Platypodidae, Dryophthoridae and Curculionidae (Coleoptera: Curculionoidea). *Esakia* **2004**, *44*, 153–168.
67. Legalov, A.A. New and little known Apioninae (Coleoptera, Brentidae) in Eocene Baltic amber. *Evraz. Entomol. Zhurn.* **2012**, *11*, 219–222.
68. Legalov, A.A. A review of the tribe Auletini (Coleoptera, Rhynchitidae) from the Russian fauna. 2. Subtribe Pseudomesauletina. *Zool. Zhurnal* **2011**, *90*, 149–155. [CrossRef]
69. Legalov, A.A. New weevils (Coleoptera, Curculionoidea) from the Eocene of the Green River, United States: Part 1. *Paleontol. J.* **2018**, *52*, 294–302. [CrossRef]
70. Legalov, A.A. New weevils (Coleoptera, Curculionoidea) from the Eocene of the Green River, United States: Part 2. *Paleontol. J.* **2018**, *52*, 421–428. [CrossRef]
71. Legalov, A.A. A review of the Curculionoidea (Coleoptera) from European Eocene ambers. *Geosciences* **2020**, *10*, 16. [CrossRef]
72. Legalov, A.A. A new tribe of the subfamily Cretonemonychinae (Coleoptera, Nemonychidae) from the Middle Eocene of the Green River. *Paleontol. J.* **2013**, *47*, 410–413. [CrossRef]
73. Scudder, S.H. Fossil Coleoptera from the Rocky mountain tertiaries. *Bull. US Geol. Geogr. Surv. Terr.* **1876**, *2*, 77–87.
74. Scudder, S.H. The fossil insects of the Green River shales. *Bull. US Geol. Geogr. Surv. Terr.* **1878**, *4*, 747–776.
75. Riedel, A. A new tribe, genus and species of Nemonychidae from Baltic amber (Coleoptera: Curculionoidea: Nemonychidae: Cimberidinae). *Insect Syst. Evol.* **2010**, *41*, 29–38. [CrossRef]
76. Wickham, H.F. Fossil Coleoptera from Florissant, with descriptions of several new species. *Bull. Am. Mus. Nat. Hist.* **1911**, *30*, 53–69.
77. Scudder, S.H. Tertiary rhynchophorus Coleoptera of the United States. *Monogr. US Geol. Surv. Tert.* **1893**, *21*, 1–206. [CrossRef]

78. Scudder, S.H. The Tertiary insects of North America. *US Geol. Surv. Terr.* **1890**, *13*, 1–734.
79. Zherikhin, V.V. On weevils (Insecta, Coleoptera) from the Baltic amber. *Tr. Paleontol. Inst. Akad. Nauk. SSSR.* **1971**, *130*, 197–209.
80. Voss, E. Einige Rhynchophoren der Bernsteinfauna (Col.). *Mitt. aus dem Geol. Staatsinst. Hambg.* **1953**, *22*, 119–140.
81. Legalov, A.A.; Kirejtshuk, A.G.; Nel, A. New weevils (Coleoptera, Curculionoidea) from the earlymost Eocene Oise amber. *Paleontol. J.* **2019**, *53*, 729–751. [CrossRef]
82. Legalov, A.A. New Curculionoid beetles (Coleoptera: Curculionoidea) from the Baltic amber. *Paleontol. J.* **2012**, *46*, 262–272. [CrossRef]
83. Gratshev, V.G.; Perkovsky, E.E. New species of the genus *Glaesotropis* (Insecta: Coleoptera: Anthribidae) from Rovno amber. *Paleontol. J.* **2008**, *42*, 60–63.
84. Gratshev, V.G.; Zherikhin, V.V. A new anthribid genus from the Baltic amber (Insecta: Coleoptera: Anthribidae). *Mitt. aus dem Geol. -Paläontologischen Intitut der Univ. Hambg.* **1995**, *78*, 149–157.
85. Heyden, C.; Heyden, L. Käfer und Polypen aus der Braunkohle des Siebengebirges, XXII–XXIV. *Palaeontographica* **1866**, *15*, 131–156.
86. Legalov, A.A.; Nazarenko, V.Y.; Perkovsky, E.E. A new genus of fungus weevils (Coleoptera: Anthribidae) in Rovno amber. *Foss. Rec.* **2018**, *21*, 207–212. [CrossRef]
87. Foerster, B. Die Insekten des 'Plattigen Steinmergels' von Brunstatt, XI–XVI. *Abh. Geol. Spec. Elsass Lotheringen* **1891**, *3*, 333–594.
88. Heyden, C.H.G. Gliederthiere aus der Braunkohle des Niederrhein's, der Wetterau und der Röhn. *Palaeontographica* **1862**, *10*, 62–82.
89. Schlechtendal, D.H.R. Beiträge zur Kenntnis Fossiler Insekten aus dem Braunkohlengebirge von Rott am Sie bengebirge, XII–XIV. *Abh. Nat. Gesellsch. Halle* **1894**, *20*, 197–228.
90. Legalov, A.A. Two new genera and four new species of fossil weevils (Coleoptera: Curculionoidea) in Baltic amber. *Entomol. Fenn.* **2016**, *27*, 57–69. [CrossRef]
91. Legalov, A.A.; Poinar, G.O., Jr. Two new species and new findings of Curculionoidea (Insecta: Coleoptera) in Baltic amber. *Ukr. J. Ecol.* **2020**, *10*, 357–364. [CrossRef]
92. Legalov, A.A. A new weevil genus of the tribe Metrioxenini (Coleoptera: Belidae) in Eocene Baltic amber. *Hist. Biol.* **2012**, *24*, 213–217. [CrossRef]
93. Riedel, A.; dos Santos Rolo, T.; Cecilia, A.; van de Kamp, T. Sayrevilleinae Legalov, a newly recognised subfamily of fossil weevils (Coleoptera, Curculionoidea, Attelabidae) and the use of synchrotron microtomography to examine inclusions in amber. *Zool. J. Linn. Soc.* **2012**, *165*, 773–794. [CrossRef]
94. Kania, J.; Legalov, A.A. A new genus of tooth-nosed snout weevils (Coleoptera: Rhynchitidae) in Baltic amber. *Paleontol. J.* **2019**, *53*, 1040–1044. [CrossRef]
95. Bukejs, A.; Legalov, A.A. The first record of Rhynchitidae (Coleoptera) from Rovno amber. *Entomol. Fenn.* **2019**, *30*, 168–172. [CrossRef]
96. Wickham, H.F. A report on some recent of fossil Coleoptera from the Miocene Shales of Florissant, I–VIII. *Bull. Lab. Nat. Hist. St. Univ. Iowa* **1912**, *6*, 3–38.
97. Wickham, H.F. Fossil Coleoptera from the Wilson Ranch near Florissant, Colorado, I–VII. *Bull. Lab. Nat. Hist. State. Univ. Iowa.* **1913**, *6*, 3–29.
98. Zherikhin, V.V. Tertiary weevils (Insecta, Coleoptera: Curculionoidea), identified from the collections of the Senckenberg Museum, Senckenberg. *Lethaea* **1992**, *72*, 169–178.
99. Piton, L. *Paléontologie du gisement Éocène de Menat (PuydeDôme) (Flore et faune)*; Imprim. Paul Vallier: ClermontFerrand, France, 1940.
100. Wickham, H.F. New fossil Coleoptera from the Florissant beds Bull. *Lab. Nat. Hist. St. Univ. Iowa* **1916**, *7*, 3–19, pls. I–IV.
101. Wickham, H.F. On some fossil Rhynchophorus Coleoptera from Florissant Colorado, I–IV. *Bull. Am. Mus. Nat. Hist.* **1912**, *31*, 41–55.
102. Rheinheimer, J. Neue fossile Rüsselkäfer (Coleoptera: Curculionidae) aus dem Eozän des Baltischen Bernsteins und der Grube Messel bei Darmstadt. *Staatliches. Mus. Nat.* **2007**, *365*, 1–24.
103. Legalov, A.A. The oldest Brentidae and Curculionidae (Coleoptera: Curculionoidea) from the Aptian of Bon-Tsagaan. *Hist. Biol.* **2014**, *26*, 6–15. [CrossRef]

104. Legalov, A.A. Two new weevil genera of the family Brentidae (Coleoptera) in Baltic amber. *Entomol. Fennica* **2018**, *29*, 161–168. [CrossRef]
105. Voss, E. Einige Rüsselkäfer der Tertiärzeit aus baltischen Bernstein (Coleoptera, Curculionidea). *Steenstupia* **1972**, *2*, 167–181.
106. Legalov, A.A.; Bukejs, A. *Succinapion telnovi* n. gen. et n. sp. of the tribe Kalcapiini (Coleoptera: Brentidae: Apioninae) in Baltic amber. *Hist. Biol.* **2014**, *26*, 603–607. [CrossRef]
107. Wagner, H. Ein neues *Apion* aus dem baltischen Bernstein (Coleoptera, Curculionidae). *Deut. Entomol. Zeitsch.* **1924**, *1924*, 134–136.
108. Bukejs, A.; Legalov, A.A. The first record of Brentidae (Coleoptera) in Eocene Rovno amber with description of a new fossil species of *Toxorhynchus* Scudder, 1893. *Fossil Record* **2020**, *23*, 169–177. [CrossRef]
109. Legalov, A.A. New weevils of the family Brentidae (Coleoptera) in Baltic amber. *Paleontol. J.*. (In Press).
110. Oustalet, M.E. Recherches sur les insectes fossiles des terraines tertiaires de la France. 2me partie. Insectes fossiles d'Aix en Provence. *Ann. Sci. Géol. Paris* **1874**, *5*, 1–347.
111. Legalov, A.A. First record of the weevil subfamily Nanophyinae (Coleoptera, Brentidae) from the Eocene of the Green River, United States. *Paleontol. J.* **2015**, *49*, 399–401. [CrossRef]
112. Théobald, N. Les insectes fossiles des terrains oligocènes de France. *Bull. Mensuel. Soc. Sci. Nancy* **1937**, *1*, 1–473.
113. Legalov, A.A.; Wappler, T. The oldest record of straight-snouted weevils (Coleoptera: Curculionoidea: Brentidae: Brentinae) from the Eocene of Germany. *Hist. Biol.* **2019**, 1–9. [CrossRef]
114. Britton, E.B. Beetles from the London clay (Eocene) of Bognor regis, Sussex. *Bull. Br. Mus. Nat. Hist. Geol.* **1960**, *4*, 27–50.
115. Legalov, A.A. New weevils (Curculionidae) in Baltic amber. *Paleontol. J.* **2016**, *50*, 970–985. [CrossRef]
116. Bukejs, A.; Legalov, A.A. A new species of the genus *Dorytomus* Germar, 1817 (Coleoptera, Curculionidae) from Baltic amber. *Entomol. Fenn.* **2019**, *30*, 173–178. [CrossRef]
117. Legalov, A.A.; Nazarenko, V.Y.; Perkovsky, E.E. New weevils (Coleoptera: Curculionidae) from Rovno amber. *Paleontol. J.* **2019**, *53*, 1045–1059. [CrossRef]
118. Legalov, A.A. Checklist of Mesozoic Curculionoidea (Coleoptera) with description of new taxa. *Balt. J. Col.* **2010**, *10*, 71–101.
119. Oustalet, F.E. Recherches sur les insectes fossiles des terraines tertiaires de la France. *Ann. Sci. Géol. Paris* **1870**, *2*, 1–178.
120. Beier, M. Miozäne und oligozäne Insekten aus Österreich und den unmitulbar angrenzenden Gebieten. *Sitzungsberichte Österreichische Akademie der Wissenschaften, Mathe MatischenNaturwissensschaftliche Klasse, Abteilung 1: Biologie, Mineralogie, Erdkunde und vewandte Wissenschaften* **1952**, *161*, 129–134.
121. Hustache, A. Un curculionide de l'ambre de la Baltique. *Bull. Mens. Soc. Lin. Lyon.* **1942**, *11*, 108–109. [CrossRef]
122. Ulke, T. A new genus and species of Curculionidae (Coleoptera) in Baltic amber. *Not. Nat.* **1947**, *19*, 1–5.
123. Cockerell, T.D.A. Some Eocene insects from Colorado and Wyoming. *Proc. Unit. Stat. Nat. Mus.* **1921**, *59*, 29–39. [CrossRef]
124. Haupt, H. Die Käfer (Coleoptera) aus der Eozänen Braunkohle des Geiseltales. *Geologica* **1950**, *6*, 1–168.
125. Bukejs, A.; Alekseev, V.I.; Legalov, A.A. A new Eocene genus of the subtribe Tylodina (Coleoptera: Curculionidae) and notes concerning local differences of Baltic amber in the Kaliningrad Region. *Foss. Rec.* **2020**, *23*, 75–81. [CrossRef]
126. Deichmueller, J.V. Fossile Insecten aus dem Diatomeenschiefir von Kutschlin bei Bilin, Böhmen. *Nova Acta Leopold. Verh. Kais. Leopold.Carol. Dtsch. Akad. Nat.* **1881**, *42*, 293–331.
127. Meunier, F. Sur quelques nouveaux insectes des lignites oligocenès (Aquitanien) de Rott, Siebengebirge (Rhénanie). *Konin. Akad. Wetensch. Amst.* **1924**, *26*, 605–612.
128. Heyden, C.H.G. Fossile Insekten aus der Braunkohle der Sieblos. *Palaeontographica* **1858**, *5*, 115–120.
129. Nazarenko, V.Y.; Perkovsky, E.E. A new genus and species of Dryophthorid weevils (Coleoptera, Dryophthoridae: Stromboscerinae) from the Rovno amber. *Paleontol. J.* **2009**, *43*, 1097–1100. [CrossRef]
130. Piton, L.; Theobald, N. La faune entomologique des gisements miopliocènes du Massif Central. *Rev. Sci. Nat. Auvergne* **1935**, *2*, 1–81.
131. Cockerell, T.D.A. Some tertiary fossil insects. *An. Mag. Nat. Hist.* **1926**, *18*, 313–324. [CrossRef]

132. Kuska, A. Three new species of beetles (Coleoptera: Cantharidae, Anobiidae, Curculionidae) from the Baltic amber. *Ann. Up. Sil. Mus. Bytom Entomol.* **1992**, *3*, 107–113.
133. Nazarenko, V.Y.; Legalov, A.A.; Perkovsky, E.E. A new species of the genus *Caulophilus* Woll. (Coleoptera: Curculionidae: Cossoninae) from the Rovno amber. *Paleontol. J.* **2011**, *45*, 287–290. [CrossRef]
134. Cockerell, T.D.A. Tertiary insects from Argentina, I. *Proc. Unit. Stat. Nat. Mus.* **1925**, *68*, 1–5. [CrossRef]
135. Meunier, F. Über einige fossile Insekten aus den Braunkohlenschichten (Aquitanien) von Rott (Siebengebirge). *Z. Deut. Geol. Gesellsch.* **1916**, *67*, 205–225.
136. Wickham, H.F. New species of fossil beetles from Floris sant, Colorado. *Proc. US Nat. Mus.* **1917**, *52*, 463–472. [CrossRef]
137. Cockerell, T.D.A. Fossil arthropods in the British Museum. II. *An. Mag. Nat. Hist.* **1920**, *9*, 273–279. [CrossRef]
138. Legalov, A.A.; Bukejs, A. A new genus of the tribe Ceutorhynchini (Coleoptera: Curculionidae) in Baltic amber. *Entomol. Fenn.* **2018**, *29*, 185–190. [CrossRef]
139. Kuska, A. New beetle species (Coleoptera, Cantharidae, Curculionidae) from the Baltic amber. *Pr. Muz. Ziemi* **1996**, *44*, 13–23.
140. Legalov, A.A. A new tribe Palaeoanoplini trib. nov. (Coleoptera: Curculionidae) in Baltic amber. *Paleontol. J.*. (in press).
141. Legalov, A.A. A new genus of the tribe Curculionini (Coleoptera: Curculionidae) from Baltic amber. *Paleontol. J.* **2019**, *53*, 1036–1039. [CrossRef]
142. Zherikhin, V.V. A weevil of the tribe Curculionini (Insecta: Coleoptera, Curculionidae) from the Paleogene of Havighorst, Germany. *Mitt. Geol.–Paläontol. Inst. Hambg.* **1995**, *78*, 145–148.
143. Cockerell, T.D.A. New species of North American fossil beetles, cockroaches and tsetse flies. *Proc. Unit. Stat. Nat. Mus.* **1918**, *54*, 301–311, pls. 54–55. [CrossRef]
144. Bukejs, A.; Legalov, A.A. *Groehnius*, a new genus of Eugnomini (Coleoptera: Curculionidae) from Eocene Baltic amber. *Foss. Rec.* **2019**, *22*, 45–49. [CrossRef]
145. Nazarenko, V.Y.; Perkovsky, E.E. A new species of derelomine weevils (Coleoptera, Curculionidae, Curculioninae: Acalyptini) from the Rovno amber. *Paleontol. J.* **2016**, *50*, 991–996. [CrossRef]
146. Heer, O. Ueber die fossilen Insecten von Aix in der Provence. *Vierteljahr. Naturforsch. Gesllschaft. Zürich* **1856**, *5*, 1–40.
147. Germar, E.F. Ueber einige Insekten aus Tertiärgebildungen. *Z. Deut. Geol. Gesellsch.* **1849**, *1*, 52–66. [CrossRef]
148. Nicolas, M. Insectes fossiles d'Aix (Provence). Descriptions de Quelques Nouvelles Espèces (Collection de M. Matheron). *Assoc. Fr. pour l'Avancement Sci.* **1891**, *2*, 425–438.
149. Giebel, C.G.A. Fauna der Vorwelt mit steter Berücksichtigung der lebenden Thiere. Insecten und Spinnen. *Monogr. Dargestellt* **1856**, *2*, 1–511.
150. Zherikhin, V.V. Oligocene seed beetles and weevils (Coleoptera: Bruchidae, Curculionidae) from Bol'shaya Svetlovodnaja River (northern Primorie). In *Kainozoi Dal'nego Vost. (Cenozoic of the Far East)*; Institute Biology Soil Science: Vladivostok, Russia, 1989; pp. 145–150.
151. Legalov, A.A.; Bukejs, A. A new species of the genus *Archaeocallirhopalus* (Coleoptera: Curculionidae) in Baltic amber. *Entomol. Fenn.* **2015**, *26*, 25–29. [CrossRef]
152. Haupt, H. Beitrag zur Kenntnis der Eozänen Arthropodenfauna des Gieseltales. *Nova Acta Leopoldiana* **1956**, *18*, 1–90.
153. Wanat, M.; Borovec, L. New genus of weevil (Coleoptera, Curculionidae) from Baltic amber. *Pol. Pismo Entomol.* **1986**, *56*, 243–247.
154. Yunakov, N.N.; Kirejtshuk, A.G. New genus and species of broad-nosed weevils from Baltic amber and notes on fossils of the subfamily Entiminae (Coleoptera, Curculionidae). *ZooKeys* **2011**, *160*, 73–96. [CrossRef] [PubMed]
155. Bukejs, A.; Legalov, A.A. First record of the tribe Naupactini (Coleoptera: Curculionidae) in Rovno amber. *Foss. Rec.* **2019**, *22*, 25–30. [CrossRef]
156. Wickham, H.F. New Miocene Coleoptera from Florissant. *Bull. Mus. Compar. Zool.* **1914**, *58*, 423–494, pls. 1–16.
157. Germar, E.F. *Fauna Insectorum europae. 19. Insectorum Protogaea Specimen Systems Insecta Carbonum Fossilum*; Kuemmelii: Halae, Germany, 1837; Available online: http://dl.ub.uni-freiburg.de/diglit/germar1837 (accessed on 6 September 2020).

158. Williams, M.Y. The stratigraphy and palaeontology of Hong Kong and the new territories. *Trans. Royal. Soc. Can.* **1943**, *3*, 93–116.
159. Cockerell, T.D.A. The fauna of the Sunchal (or Margas Verdes) Formation, Northern Argentina. *Am. Mus. Nov.* **1936**, *886*, 1–9.
160. Wickham, H.F. Coleoptera from the Lower Eocene (Wilcox) clays. *J. Wash. Acad. Sci.* **1929**, *19*, 148–150.
161. Heer, O. Die miocene Flora and Fauna Spitsbergens, I–XVI. *Kongl. Sven. Vetensk.–Akad. Handl.* **1870**, *8*, 1–98.
162. Cockerell, T.D.A. Fossil arthropods in the British Museum. III. *An. Mag. Nat. Hist.* **1920**, *9*, 65–72. [CrossRef]
163. Cockerell, T.D.A. Some American fossil Insects. *Proc. Unit. Stat. Nat. Mus.* **1917**, *51*, 89–106. [CrossRef]
164. Piton, L.; Rudel, M.A. Sur de nouveaux gisemente d'Insectes fossiles dans l'Oligocene de la Limagne. *Bull. Mens. Soc. Linn. Lyon* **1936**, *5*, 78–81.
165. Cockerell, T.D.A. Eocene fossils from Green River, Wioming. *Am. J. Sci.* **1909**, *28*, 447–448. [CrossRef]
166. Piton, L.; Theobald, N. Les insectes fossiles du PuydeMur (Limagne). *Bull. Menseul. Soc. Sci. Nancy* **1937**, *9*, 202–214.
167. Peris, D.; Solórzano Kraemer, M.M.; Smith, S.M.; Cognato, A.I. *Eoplatypus jordali* gen.n. et sp.n., the first described Platypodinae (Coleoptera: Curculionidae) from Baltic amber. *Arthropod Syst. Phyl.* **2017**, *75*, 85–194.
168. Schedl, K. Die Borkenkäfer des baltischen Bernsteins. *Zent. Ges. Entomol.* **1947**, *2*, 12–45.
169. Hagedorn, M. Borkenkäfer des baltischen Bersteins. *Schr. Phys.-Ökonom. Gesell. König. Prus.* **1906**, *47*, 115–121.
170. Germar, E.F. Insekten in Bernstein eingeschlossen, beschrieben aus dem academischen Mineralien Cabinet zu Halle. *Mag. Entomol.* **1813**, *1*, 11–18.
171. Petrov, A.V.; Zherikhin, V.V. A new species of bark beetles of the genus *Hylesinus* (Insecta: Coleoptera: Scolytidae) from the Oligocene of France. *Paleontol. J.* **2004**, *38*, 187–189.
172. Petrov, A.V.; Perkovsky, E.E. New species of bark beetles from the Rovno amber (Insecta: Coleoptera: Scolytidae). *Paleontol. J.* **2008**, *42*, 406–408. [CrossRef]
173. Petrov, A.V.; Perkovsky, E.E. A new genus and species of Scolytinae (Coleoptera: Curculionidae) from the Rovno amber. *Paleontol. J.* **2018**, *52*, 164–167. [CrossRef]
174. Martins-Neto, R.G. Review of some Insecta from Mesozoic and Cenozoic Brazilian deposits with descriptions of new taxa. *Acta Geol. Leop.* **2001**, *24*, 115–124.
175. Motschulsky, V. Voyages. Lettres de M. de Motschulsky a M. Ménétriés, 4. *Étud. Entomol.* **1857**, *5*, 21–38.
176. Lin, Q.B.; Lee, C.M. Early Tertiary insects from Peng Chau, Hong Kong. *Palaeontol. Strat. Hong Kong* **1997**, *1*, 185–199.
177. Legalov, A.A. Fossil history of Mesozoic weevils (Coleoptera: Curculionoidea). *Insect Sci.* **2012**, *19*, 683–698. [CrossRef]
178. Kuschel, G. Reappraisal of the Baltic Amber Curculionoidea described by E. Voss. *Mitt. Geol.-Paläontol. Inst. Hambg.* **1992**, *73*, 191–215.
179. Legalov, A.A. A review of fossil and recent species of the family Ithyceridae (Coleoptera) from the world fauna, I–IV. *Amur. Zool. Zh.* **2009**, *1*, 117–131.
180. Legalov, A.A. A new classification of ecological groups of the leaf-rolling weevils (Coleoptera: Rhynchitidae, Attelabidae). *Evraz. Entomol. Zhur.* **2004**, *3*, 43–45.
181. Caldara, R.; Franz, N.M.; Oberprieler, R.G. Chapter 2. Curculioninae Latreille 1802. In *Handbook of Zoology. Arthropoda: Insecta. Coleoptera, Beetles*; Volume 3: Morphology and systematics (Phytophaga); Kristensen, N.P., Beutel, R.G., Eds.; Walter de Gruyter: Berlin, Germany; New York, NY, USA, 2014; Volume 3, pp. 589–628.
182. Meregalli, M. 3.7.6. Lixinae Schoenherr 1823. In *Handbook of Zoology. Arthropoda: Insecta. Coleoptera, Beetles*; Volume 3: Morphology and Systematics (Phytophaga); Kristensen, N.P., Beutel, R.G., Eds.; Walter de Gruyter: Berlin, Germany; New York, NY, USA, 2014; Volume 3, pp. 523–528.
183. Alonso-Zarazaga, M.A. Revision of the supraspecific taxa in the Palaearctic Apionidae Schoenherr 1823 (Coleoptera, Curculionoidea). 2. Subfamily Apioninae Schoenherr, 1823: Introduction, keys and descriptions. *Graellsia* **1990**, *46*, 19–156.
184. Gruas-Cavagnetto, C. Etude palynologique del'Eocene du Bassin Anglo-Parisien. *Mem. Soc. Geol. Fr.* **1978**, *56*, 1–64.
185. Archibald, S.B.; Mathewes, R.W. Early Eocene insects from Quilchena, British Columbia and their paleoclimatic implications. *Can. J. Zool.* **2000**, *78*, 1441–1462. [CrossRef]

186. Gratshev, V.G.; Zherikhin, V.V. The fossil record of weevils and related beetle families (Coleoptera, Curculionoidea). *Acta Zool. Cracov.* **2003**, *46*, 129–138.
187. Wilf, P.; Donovan, M.P.; Cúneo, N.R.; Gandolfo, M.A. The fossil flip-leaves (Retrophyllum, Podocarpaceae) of southern South America. *Am. J. Bot.* **2017**, *104*, 1344–1369. [CrossRef] [PubMed]
188. Lyal, C.H.C. 3.7.7. Molytinae Schoenherr 1823. In *Handbook of Zoology. Arthropoda: Insecta. Coleoptera, Beetles*; Volume 3: Morphology and Systematics (Phytophaga); Kristensen, N.P., Beutel, R.G., Eds.; Walter de Gruyter: Berlin, Germany; New York, NY, USA, 2014; Volume 3, pp. 529–569.
189. Klebs, R. Über Bernsteinschlüsse im allgemein und die Coleopteren meiner Bernsteinsammlung. *Schr. Phys.-ökonom. Gesellsch. Königsberg in Pr.* **1910**, *51*, 217–242.
190. Kirejtshuk, A.G.; Nel, A. Current knowledge of Coleoptera (Insecta) from the lowermost Eocene Oise amber. *Insect Syst. Evol.* **2013**, *44*, 175–201. [CrossRef]
191. Alekseev, V.I. Coleoptera from the middle-upper Eocene European ambers: Generic composition, zoogeography and climatic implications. *Zootaxa* **2017**, *4290*, 401–443. [CrossRef]
192. O'Brien, C.W.; Tang, W. Revision of the New World cycad weevils of the subtribe Allocorynina, with description of two new genera and three new subgenera (Coleoptera: Belidae: Oxycoryninae). *Zootaxa* **2015**, *3970*, 1–87. [CrossRef] [PubMed]
193. Poinar, G.J.; Legalov, A.A. *Pleurambus strongylus* n. gen., n. sp. (Coleoptera: Belidae) in Dominican amber. *Hist. Biol.* **2014**, *26*, 670–674. [CrossRef]
194. Hassan, M.Y. Tertiary faunas from Kap Brewster, East Greenland. *Medd. om Grønland* **1953**, *111*, 1–42.
195. Lutz, H. Beitrag zur Kenntnis der unteroligozänen Insektenfauna von Cereste (Süd-Frankreich). *Doc. Nat.* **1984**, *21*, 1–26.
196. Prokop, J.; Fikacek, M. Early Oligocene insect fauna from Seifhennersdorf (Saxony, Germany). *Acta Mus. Nat. Pragae* **2007**, *63*, 205–213.
197. Cifuentes-Ruiz, P.; Vega, F.J.; Cevallos Ferriz, S.R.S.; Gonzalez-Soriano, E.; Zaragoza Caballero, S.; Garibayromero, L. Oligocene Scorpion and insects (Plecoptera and Coleoptera) from the Los Ahuehuetes Locality, Puebla, Mexico. *Ameghiniana* **2007**, *44*, 673–679.
198. Prokop, J. Remarks on palaeoenviromental changes based on reviewed Tertiary insect associations from the Krušnéhory piedmont basins and the Èeské støedohoøí Mts in northwestern Bohemia (Czech Republic). *Acta Zool. Cracov.* **2003**, *46*, 329–344.
199. Wedmann, S.; Poschmann, M.; Hörnschemeyer, T. Fossil insects from the Late Oligocene Enspel Lagerstätte and their palaeobiogeographic and palaeoclimatic significance. *Palaeobio. Palaeoenv.* **2010**, *90*, 49–58. [CrossRef]
200. Kirejtshuk, A.G.; Ponomarenko, A.G.; Kurochkin, A.S.; Alexeev, A.V.; Gratshev, V.G.; Solodovnikov, A.V.; Krell, F.-T.; Soriano, C. The beetle (Coleoptera) fauna of the Insect Limestone (late Eocene), Isle of Wight, southern England. *Earth Env. Sci. Trans. R. Soc. Edinb.* **2019**, *110*, 405–492. [CrossRef]