Beetle fauna found on carrion in three woodland sites in Luxembourg (Insecta, Coleoptera)

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Abstract. The beetle fauna attracted by carcasses deposited at three different woodland sites in Luxembourg was investigated. The locations were in the Oesling, the central Gutland and in the Moselle valley, respectively. The carcasses were freshly killed rabbits attached to the forest ground. Beetles belonging to the families Carabidae, Catopidae, Chrysomelidae, Cleridae, Cryptophagidae, Dasytidae, Dermestidae, Geotrupidae, Histeridae, Hydrophilidae, Malachiidae, Nitidulidae, Scarabaeidae, Silphidae, Staphylinidae and Tenebrionidae were collected. Two species of Staphylinidae, *Anotylus mutator* (Lohse, 1963) and *Bisnius parcus* (Sharp, 1874), are new to the fauna of Luxembourg.

1. Introduction

In natural ecosystems vertebrate carcasses are a resource limited in time and space. Their fleshy parts are usually consumed by maggots of the dipteran Calliphoridae (Tantawi et al. 1996, Miralbes 2002). The time needed for decomposition is mainly determined by temperature and this process may be completed in less than three weeks (Grassberger 2004). Beetle diversity is higher on carcasses exposed in woodland than on those deposited in open, grassy meadows (Kocarek 2002). The beetle fauna visiting carrion was found to vary greatly in the course of a year with regard to the species involved, its diversity being least in winter (Arnaldos et al. 2004). The most frequently encountered beetle families are the saprophagous Silphidae and Scarabaeidae, the predatory Histeridae and the predatory or parasitoid Staphylinidae (Peschke et al. 1987).

Of the above mentioned families an up to date checklist, though still a provisional one, is currently only available for the rove beetles (Staphylinidae) (Bruge et al. 2001, Gerend 2006).

The aim of this paper is to present the beetle fauna encountered on the carcasses and to discuss the faunistically important aspects of the data.

2. Methods

In 2004 and 2005 carcasses were placed in three different sites in Luxembourg. The first locality is on sandy soil in a beech grove near „Fautelfiels“ east of Helmdange (32U 294605 m E, 5508609 m N, 410 m a.s.l.). The second location is in a beech grove called „Leidweiler“ west of Stadtbredimus (32U 307927 m E, 5494713 m N, 245 m a.s.l.) and the third place is an oak forest known as „Schwarzestack“ south of Dirbach (32U 286827 m E, 5533392 m N, 370 m a.s.l.).

In spring, summer and autumn of both years a freshly killed rabbit was exposed in each of the three sites. The carcasses were rolled in netting wire and fixed to the ground with tent pegs. Every second day they were shaken over a collecting tray and the beetles thus removed were caught with a pair of tweezers. Litter from under the carrion was carefully searched for beetles. The insects were then transferred to a jar and killed with ethylacetate vapours.

The sampled specimens were identified with the help of the keys provided by Freude et al. (1964 ff). The nomenclature follows Fauna Europaea (2004). The majority of the Aleocharinae (Staphylinidae) were not identified down to the species level.

Table 1. List of the beetles caught on the carcasses at the three sites in Luxembourg. Asterisk (*): species new for Luxembourg. (**): first record of the species from the Oesling (Dirbach).

Taxon	Helmdange	Dirbach	Stadtbredimus
Carabidae			
Abax ovalis (Duftschmid, 1812)		x	
Limodromus assimilis (Paykull, 1790)			x
Pterostichus oblongopunctatus (Fabricius, 1787)		x	
Catopidae			
Catops coracinus (Kellner, 1846)	x	x	x
Catops kirbyi (Spence, 1815)	x	x	x
Catops neglectus (Kraatz, 1852)	x	x	
Catops nigrita (Erichson, 1837)	x		x
Catops picipes (Fabricius, 1792)	x		
Catops subfuscus (Kellner, 1846)	x		
Catops tristis (Panzer, 1794)	x	x	x
Sciodrepoides fumatus (Spence, 1815)	x	x	x
Sciodrepoides watsoni (Spence, 1815)	x	x	x
Chrysomelidae			
Chrysomela varians (Schaller, 1783)			x
Cleridae			
Necrobia ruficollis (Fabricius, 1775)		x	
Necrobia violacea (Linnaeus, 1758)	x	x	x
Cryptophagidae			
Cryptophagus spec. (Herbst, 1792)	x	x	
Atomaria spec. (Stephens, 1830)		x	
Dasytidae			
Metadasytes nigrocyaneus (Mulsant et R., 1868)	x		
Dermestidae			
Dermestes murinus (Linnaeus, 1758)			x
Dermestes undulatus (Brahm, 1790)			x
Geotrupidae			
Anoplotrupes stercorosus (Scriba, 1791)	x	x	x
Histeridae			
Hister striola (Sahlberg, 1819)	x	x	x
Hister unicolor (Linnaeus, 1758)	x		x
Margarinotus neglectus (Germar, 1813)		x	
Saprinus lautus (Erichson, 1839)	x		x
Saprinus semistriatus (Scriba, 1790)	x	x	x
Hydrophilidae			
Cercyon spec. (Leach, 1817)	x	x	x
Megasternum concinnum (Marsham, 1802)		x	x
Malachiidae			
Malachius bipustulatus (Linnaeus, 1758)		x	
Nitidulidae			
Epuraea unicolor (Olivier, 1790)	x		
Omosita colon (Linnaeus, 1758)	x	x	x
Omosita depressa (Linnaeus, 1758)	x	x	x
Omosita discoidea (Fabricius, 1775)	x	x	x
Scarabaeidae			
Onthophagus coenobita (Herbst, 1783)			x
Onthophagus vericicornis (Laicharting, 1781)			x
Silphidae			
Necrodes littoralis (Linnaeus, 1758)	x	x	x

Nicrophorus fossor (Erichson, 1837)	x	x	
Nicrophorus humator (Gleditsch, 1767)	x		x
Nicrophorus investigator (Zetterstedt, 1824)	x		
Nicrophorus vespillo (Linnaeus, 1758)	x		
Nicrophorus vespilloides (Herbst, 1784)	x	x	x
Oeceoptoma thoracica (Linnaeus, 1758)	x	x	x
Thanatophilus sinuatus (Fabricius, 1775)	x	x	x
Staphylinidae			
Aleocharinae			
Aleochara curtula (Goeze, 1777)**	x	x	x
Aleochara lata (Gravenhorst, 1802)**	x	x	x
Autalia longicornis (Scheerpeltz, 1947)	x	x	x
Omaliinae			
Acrulia inflata (Gyllenhal, 1813)		x	
Omalium caesum (Gravenhorst, 1806)**	x	x	
Omalium rivulare (Paykull, 1789)		x	x
Omalium rugatum (Mulsant et R., 1880)	x	x	x
Oxytelinae			
Anotylus spec. (Thomson, 1859)	x	x	x
Anotylus mutator (Lohse, 1963)*	x		
Anotylus tetracarinatus (Block, 1799)	x		x
Platystethus arenarius (Fourcroy, 1785)**	x	x	x
Paederinae			
Rugilus rufipes (Germar, 1836)**	x	x	
Proteininae			
Megarthrus depressus (Paykull 1789)**	x		
Proteinus brachypterus (Fabricius, 1792)		x	
Proteinus crenulatus (Pandellé, 1867)	x		x
Proteinus ovalis (Stephens, 1832)			x
Staphylininae			
Bisnius fimetarius (Gravenhorst, 1802)	x	x	x
Bisnius parcus (Sharp, 1874)*		x	
Bisnius sordidus (Gravenhorst, 1802)	x	x	
Creophilus maxillosus (Linnaeus, 1758)	x	x	
Othius punctulatus (Goeze, 1777)			x
Philonthus addendus (Sharp et S., 1867)		x	
Philonthus marginatus (Müller, 1764)		x	x
Philonthus succicola (Stephens, 1832)	x	x	x
Platydracus chalcocephalus (Fabricius, 1801)		x	x
Quedius cinctus (Paykull 1790)	x	x	
Quedius lateralis (Gravenhorst 1802)	x	x	x
Quedius lucidulus (Erichson 1839)			x
Gabrius spec. (Stephens, 1829)		x	
Xantholinus spec. (Dejean, 1821)		x	x
Tachyporinae			
Lordithon lunulatus (Linnaeus, 1761)		x	x
Tachinus humeralis (Gravenhorst, 1802)**	x	x	x
Tachinus laticollis (Gravenhorst, 1802)	x		
Tachinus pallipes (Gravenhorst, 1802)**	x	x	
Tachinus signatus (Gravenhorst, 1802)**		x	
Tachinus subterraneus (Linnaeus, 1758)		x	
Tenebrionidae			
Lagria atripes (Mulsant, 1855)			x

3. Results and discussion

In all 80 species were recorded at the three sites (table 1). 55 species were found at the site in the Oesling, 13 of them exclusively there. In the Moselle valley, near Stadtbredimus, and in the vicinity of Helmdange 49 and 51 species were recorded, respectively. 32 species were found in one of the three localities only (Dirbach 13, Stadtbredimus 10, Helmdange 9).

Two species, *Anotylus mutator* (Lohse, 1963) and *Bisnius parcus* (Sharp, 1874), are new to the fauna of the Grand-Duchy of Luxembourg, while several other ones, i.e. *Aleochara curtula, Aleochara lata, Omalium caesum, Platystethus arenarius, Rugilus rufipes, Megarthrus depressus, Tachinus humeralis, Tachinus pallipes* and *Tachinus signatus* have so far not been recorded from the northern part of the country (the Oesling).

As there are no check lists available for most of the other coleopteran families, no further comments can be made on the remaining, non-staphylinid species.

All of the recorded species are associated with decaying organic matter, except for the three Carabidae, the Malachiidae and the Chrysomelidae, which are either far ranging and carnivorous beetles, or else were recorded by accident.

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