

## First record on the Scarabaeoidea (Coleoptera) fauna of Gödöllő (Hungary)

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**First record on the Scarabaeoidea (Coleoptera) fauna of Gödöllő (Hungary)** — During a sampling interval of four years 99 Scarabaeoidea species were found at five characteristic habitats around Gödöllő. Although this number is high, because 53% of the Hungarian fauna was captured, the occurrence of further species is still possible. Species richness of permanent pasture grazed by cattle was higher than that of the wooded habitats.

There is an urgent need to discover local faunae in order to develop scientific bases of nature protection and zoological monitoring in Hungary (Bartha *et al.* 1994). To achieve this goal continuous faunistical research on several animal taxa is in progress at the Department of Zoology and Ecology of the Gödöllő University of Agricultural Sciences.

In total absence of information on the Scarabaeoidea fauna of Gödöllő, the aim of the study was to get basic data on species occurrence and distribution at some characteristic biotopes.

### METHODS

Scarabaeoidea species were collected within a distance of about 10 km to Gödöllő. Five biotopes were sampled regularly on 185 days during 1989–1992. Main characteristics of these sampling places were as follows:

Site 1. Pasture (S-1) — Experimental field of the Institute of Animal Husbandry, Gödöllő University of Agricultural Sciences. It is located near the university buildings. Permanent pasture grown with mixture of grasses, grazed by cattle.

Site 2. Clearings of wood (S-2) — Some open places in an oak wood. Dominant plant species are *Calamagrostis epigeios*, *Festuca wagneri* and *Poa pratensis*. Preferred feeding places for game animals.

Site 3. Oak plantation (S-3) — The age of oak trees is approximately 30–40 years. Shrub level is almost absent. Dominant plant species are *Quercus petraea*, *Dactylis polygama*, *Litospermum purpureo-coeruleum*, *Poa nemoralis*, *Cherophyllum temulum*.

Site 4. Cleared woodland (S-4) — Clearing was made about five years before the first sampling. Shrub level is abundant, composed first of all by the offshoots of *Quercus* stumps. Dominant plant species are *Quercus robur*, *Qu. cerris*, and *Qu. pubescens* stumps, *Cornus sanguinea*, *Calamagrostis epigeios*, *Silene vulgaris* and *Poa nemoralis*.

Site 5. Oak forest (S-5) — The age of oak is about 100 years. Shrub level is abundant. Dominant plant species are *Quercus cerris*, *Qu. pubescens*, *Acer campestre*, *Crataegus monogyna*, *Prunus spinosa*, *Melica uniflora*, *Viola odorata*, *Dactylis polygama*, *Brachipodium silvaticum*, *Lithospermum purpureo-coeruleum*, *Geum urbanum*.

Several sampling techniques were used in respect to the life-form diversity of the species.

1. The most efficient method was singling.
2. Dung inhabiting species were sampled by soaking. Dung was placed in a plastic vessel, filled with water slowly and the escaping beetles were captured. This method is especially useful for collecting *Aphodius* beetles.
3. Glass pitfall traps filled with diluted ethylene-glycol were used in several cases. It is an appropriate method to collect bigger species like *Geotrupes* spp. Individuals of smaller species were usually destroyed in this sampling device.
4. In some cases it was possible to catch *Aphodius distinctus* and *A. prodromus* by netting.
5. Smell trap is one of the best tools to collect *Cetonia*, *Liocola* and *Potosia* species. Banana, honey and water were mixed and fermented for 3–4 days. Sawdust was placed in a plastik net, saturated with this mixture and hanged on trees.
6. Two light traps with 250 W bulb were used in 1992. One of them was applied nearby the University, the second one at the hunting lodge of Valkó.

## RESULTS AND DISCUSSION

99 Scarabaeoidea species of about 1800 individuals were found during the four-year long sampling period in the region of Gödöllő. (For species list consult Appendix.) The cumulative number of species collected rose year by year. Therefore, it became clear, that the occurrence of some more species is expected in the future. Comparing numbers of species found in the whole country and near Gödöllő, it is very likely that most or all species from the following genera are caught already: *Lucanus*, *Dorcus*, *Platycerus*, *Aesalus*, *Trox*, *Bolbelasmus*, *Odontaeus*, *Geotrupes*, *Lethrus*, *Oxyomus*, *Pleurophorus*, *Sisyphus*, *Copris*, *Oniticellus*, *Caccobius*, *Onthophagus*, *Maladera*, *Amphimallon*, *Melolontha*, *Polyphylla*, *Phyllopertha*, *Oryctes*, *Epicometis*, *Oxythyrea*, *Cetonia*, *Liocola*, *Potosia*, *Valgus*, *Trichius*.

The number of species collected from this relatively small area is 53% of the whole Hungarian fauna (Ádám 1994, Endrődi 1956). It is more than the number of Scarabaeoidea species (88) found at the Hortobágy National Park (Ádám 1981) but less than that (122) found Kiskunság National Park (Ádám 1987).

The number of species found at different localities: S-1: 67, S-2: 46, S-3: 33, S-4: 14, S-5: 14. High number of Scarabaeidae was discovered at sampling place S-1, most probably because of the abundant food resources. Remarkable is the absence of Lucanidae and Trogidae species at this locality. Lowest species richness was recorded at sampling places S-4, and S-5. It has to be pointed out, however, that the most protected or endangered species were found in these habitats.

## APPENDIX

List of species with some notes of occurrence, sampling period and habitat. In spite of the fact that a very new nomenclature of Scarabaeoidea species exists in Hungary (Ádám 1994), in lack of their general acceptance a more conservative nomenclature is used.

## LUCANIDAE

**Lucanus cervus** (Linné, 1758) — Common at swarming. Sampling period: VI–VIII months. Sampling place: S-3, S-4, S-5.

**Dorcus parallelepipedus** (Linné, 1758) — Common. Sampling period: IV–VIII months. Sampling place: S-3, S-4, S-5.

**Platycerus caprea** (DeGeer, 1774) — Rare. Sampling period: 1989. VII. 4., VII. 20., VIII. 6. Sampling place: S-3, S-4.

**Aesalus scarabaeoides** (Panzer, 1794) — Very rare. Sampling period: 1992. V. 24. Sampling place: S-2.

## TROGIDAE

**Trox subulosus** (Linné, 1758) — Common on cadavers. Sampling period: IV–VIII. Sampling place: S-2, S-3.

**Trox scaber** (Linné, 1767) — Very common. Sampling period: IV–VIII. Sampling place: S-2, S-3.

**Trox cadaverinus** Illiger, 1801 — Common in some places. Sampling period: IV–VIII. Sampling place: S-3.

## SCARABAEIDAE

**Ochodaeus chrysomeloides** (Schrank, 1781) — Very rare on cow dung. Sampling period: 1991. V. 1. Sampling place: S-1.

**Bolbelasmus unicornis** (Schrank, 1789) — Very rare. Sampling period: 1992. VII. 22. Sampling place: S-2.

**Odontaeus armiger** (Scopoli, 1772) — Rare. Sampling period: 1992. VII. 22. Sampling place: S-2.

**Geotrupes spiniger** (Marsham, 1802) — Common on dung of cow and horse. Sampling period: IV–XI. Sampling place: S-1, S-2, S-3.

**Geotrupes (=Anoplotrupes) stercorosus** (Scriba, 1791) — Occasional on dung of horse and game animals. Sampling period: V–VIII months. Sampling place: S-1, S-2, S-3, S-4, S-5.

**Geotrupes (=Trypocopris) vernalis** (Linné, 1758) — Very common on dung of game animals. Sampling period: III–VIII. Sampling place: S-2, S-3, S-4, S-5.

**Lethrus apterus** (Laxmann, 1770) — Patchy distribution, at places in masses. Sampling period: IV–V. months. Sampling place: S-2.

**Aphodius (=Colobopteris) scrutator** (Herbst, 1789) — Throughout the year, but common in the fall. Lives in dung of cow. Sampling period: IX–X. months. Sampling place: S-1.



**Aphodius (=Colobopterus) subterraneus** (Linné, 1758) — Common from spring to fall in dungs of horse, cow, sheep and game animals. Sampling period: IV–IX. months. Sampling place: S-1.

**Aphodius (=Colobopterus) erraticus** (Linné, 1758) — Widespread in different kind of dung. Sampling period: IV–VII, X. months. Sampling place: S-1, S-2.

**Aphodius (=Teuchestes) fossor** (Linné, 1758) — Common, first of all in May. It was found in dung of cow. Sampling period: V–VII. months. Sampling place: S-1.

**Aphodius (=Teuchestes) haemorrhoidalis** (Linné, 1758) — Common, first of all in May. It was found in dung of cow and horse. Sampling period: V–VIII. months. Sampling place: S-1.

**Aphodius aestivalis** (=A. foetens) Stephens, 1839 — It was common in dung of horse and cow in the fall of 1990, but since then no other specimen was found. Sampling period: IX–X. months. Sampling place: S-1.

**Aphodius (=Aphodius) fimetarius** (Linné, 1758) — Common from spring to fall in various kind of dung. Sampling period: III–V, IX–X. months. Sampling place: S-1, S-2, S-3, S-5.

**Aphodius (=Calamosterus) granarius** (Linné, 1767) — Very common from spring to fall in various kind of dung. Sampling period: III–XI. months. Sampling place: S-1.

**Aphodius (=Agrilinus) ater** (DeGeer, 1774) — Rare in dung of horse and cow. Sampling period: 1991. IV. 4., V. 1. Sampling place: S-1.

**Aphodius (=Agrilinus) putridus** (Herbst, 1789) — Common in dung of cow, sheep, deer and wild-boar. Sampling period: III–IV, IX–XI. months. Sampling place: S-1, S-2, S-3, S-5.

**Aphodius (=Bodilus) immundus** Creutzer, 1799 — Sporadic in dung of cow. Sampling period: IX. months. Sampling place: S-1.

**Aphodius (=Bodilus) rufus** (Moll, 1782) — Sporadic in dung of cow and horse. Sampling period: IX–X., months. Sampling place: S-1.

**Aphodius (=Bodilus) lugens** Creutzer, 1799 — Sporadic in dung of cow and horse. Sampling period: VII–IX. months. Sampling place: S-1.

**Aphodius (=Bodilus) nitidulus** (Fabricius, 1792) = *Bodilus ictericus* Laich — Rare. Sampling period: IX. months. Sampling place: S-1.

**Aphodius (=Nialus) sturmi** Harold, 1870 — Rare in dung of cow. Sampling period: 1991. IX. 21. Sampling place: S-1.

**Aphodius (=Nialus) varians** Duftschmid, 1805 — Rare in dung of cow and sheep. Sampling period: IX. months. Sampling place: S-1.

**Aphodius (=Plagiogonus) arenarius** (Olivier, 1789) — Rare in dung of cow and wild-boar. Sampling period: III, VI. months. Sampling place: S-1, S-2.

**Aphodius (=Limarus) maculatus** (Sturm, 1800) — Rare in dung of cow and wild-boar. Sampling period: III. months. Sampling place: S-2, S-3, S-5.

**Aphodius (=Acrossus) luridus** (Fabricius, 1775) — Common, in spring dominant. Occurs in all types of dung, but dung of sheep and wild-boar preferred. Sampling period: III–V. months. Sampling place: S-1, S-2.

**Aphodius (=Acrossus) depressus** (Kugelann, 1792) — Very rare in dung of wild-boar. Sampling date: 1990. IV. 24. Sampling place: S-2.

**Aphodius (=Volinus) sticticus** (Panzer, 1798) — Sporadic in dung of horse and cow. Sampling period: IV–V, X. months. Sampling place: S-1, S-2.

**Aphodius (=Volinus) melanostictus** (W. Schmidt, 1840) — Very rare in dung of cow. Sampling dates: 1990. IX. 13., X. 28. Sampling place: S-1.

**Aphodius (=Volinus) distinctus** (Müller, 1776) — Occurrence: the most common *Aphodius* species. Occurs in all types of dung. Sampling period: III–V, X–XI. months. Sampling place: S-1, S-2, S-3, S-5.

**Aphodius (=Nimbus) obliteratus** (Panzer, 1823) — Common in spring. Occurs in dung of wild-boar, deer and wild sheep. Sampling period: III. months. Sampling place: S-2, S-3, S-5.

**Aphodius (=Melinopterus) prodromus** (Brahm, 1790) — Very common. Sampling period: III–V, IX–X. months. Sampling place: S-1, S-2, S-3, S-5.

**Aphodius (=Melinopterus) consputus** (Creutzer, 1799) — Rare in dung of cow. Sampling period: 1990. IX. 8. Sampling place: S-1.

**Aphodius (=Phalacronotus) quadriguttatus** Herbst — Rare in dung of wild-boar. Sampling period: III–IV. months. Sampling place: S-2.

**Aphodius (=Phalacronotus) biguttatus** Germar, 1824 — Common in spring. Occurs in dung of sheep and wild-boar. Sampling period: III–IV. months. Sampling place: S-2.

**Aphodius (=Amidorus) porcus** (Fabricius, 1792) — Rare in dung of cow. Sampling period: X. month. Sampling place: S-1.

**Aphodius (=Melinopterus) sabulicola** Thomson, 1868 — Widespread in spring. Occurs in various type of dung. Sampling period: IV–V. months. Sampling place: S-1, S-2, S-3, S-5.

**Aphodius (=Phalacronotus) paracoenosus** Balthazar et Hrubant, 1960 — Rare in dung of cow. Sampling period: 1991. V. 1. Sampling place: S-1.

**Aphodius (=Phalacronotus) pusillus** (Herbst, 1789) — Common in dung of cow. Sampling period: V. months. Sampling place: S-1.

**Aphodius (=Acrossu) rufipes** (Linné, 1758) — Sporadic. Sampling period: VIII. month. Sampling place: S-2.

**Aphodius (=Bodilus) sordidus** (Fabricius, 1755) — Rare in dung of cow. Sampling period: 1991. IX. 21. Sampling place: S-1.

**Aphodius scybalarius** (Fabricius, 1781) = *A. foetidus* Herbst — Very rare in dung of cow. Sampling date: 1992. VIII. 29. Sampling place: S-2.

**Oxyomus silvestris** (Scopoli, 1763) — Common in dunghill of cow. Sampling period: IV–V. months. Sampling place: S-1.

**Pleurophorus caesus** (Creutzer, 1796) — Very rare in dung of cow. Sampling date: 1992. V. 21. Sampling place: S-1.

**Sisyphus schaefferi** (Linné, 1758) — Common in dung of horse and wild-boar. Sampling period: III–IX. months. Sampling place: S-1, S-2, S-4, S-5.

**Copris lunaris** (Linné, 1758) — Common in dung of cow, horse, deer, wild sheep and wild-boar. Sampling period: IV–IX months. Sampling place: S-1, S-2, S-3.

**Oniticellus fulvus** (Goeze, 1777) — Common in dung of cow. Sampling period: V–XI. months. Sampling place: S-1.

**Caccobius schreberi** (Linné, 1767) — Sporadic, in some places abundant. Occurs in dung of cow and sheep. Sampling period: IV–VII, X. months. Sampling place: S-1.

**Ontophagus (=Euonthophagus) amyntas** (Olivier, 1789) — Rare in dung of cow and wild-boar. Sampling period: IV–VI. months. Sampling place: S-1, S-2.

**Onthophagus taurus** (Schreber, 1759) — Very common in dung of cow and wild-boar. Sampling period: V–X. months. Sampling place: S-1, S-2.

**Onthophagus illyricus** (Scopoli, 1763) — Rare in dung of cow. Sampling period: IV–VII, IX. months. Sampling place: S-1.

**Onthophagus vitulus** (Fabricius, 1776) — Rare in dung of cow and horse. Sampling date: 1992. IV. 24. Sampling place: S-1.

**Onthophagus verticicornis** (Laicharting, 1781) — Widespread in dung of cow, sheep and wild-boar. Sampling period: IV–V. months. Sampling place: S-1, S-2.

**Onthophagus furcatus** (Fabricius, 1781) — Rare in dung of cow and horse. Sampling period: IV–V. months. Sampling place: S-1.

**Onthophagus ruficapillus** Brullé, 1832 — Common in all types of dung. Sampling period: III–X. months. Sampling place: S-1, S-3.

**Onthophagus ovatus** (Linné, 1767) — Common, first of all in dung of game animals. Sampling period: III–X. months. Sampling place: S-1, S-2.

**Onthophagus lucidus** (Sturm, 1800) — Rare in dung of cow, sheep and deer. Sampling period: IV–V. months. Sampling place: S-1, S-2.

**Onthophagus lemur** (Fabricius, 1781) — Rare in dung of cow, horse and wild-boar. Sampling dates: 1990. IV. 28, 1991. IV. 4. Sampling place: S-1, S-2.

**Onthophagus gibbulus** (Pallas, 1781) — Sporadic in dung of cow. Sampling period: VII, IX. months. Sampling place: S-1.

**Onthophagus fracticornis** (Preyßler, 1790) — Very common in dung of cow. Sampling period: III–V, IX–X. months. Sampling place: S-1, S-2, S-3.

**Onthophagus coenobita** (Herbst, 1783) — Widespread in various types of dung. Sampling period: III–X. months. Sampling place: S-1, S-2, S-3.

**Onthophagus nuchicornis** (Linné, 1758) — Very common in dung of cow, horse and wild-boar. Sampling period: IV–IX. months. Sampling place: S-1, S-2.

**Onthophagus vacca** (Linné, 1767) — Occurrence: sporadic in dung of cow, horse and sheep. Sampling period: IV–V, VII. months. Sampling place: S-1, S-2.

**Maladera holosericea** (Scopoli, 1772) — Common, but hard to collect. Sampling period: III–V, IX. months. Sampling place: S-1, S-2.

**Homalopia ruricola** (Fabricius, 1775) — Very common. Sampling period: VI. month. Sampling place: S-1, S-2.

**Rhizotrogus** (= **Miltotrogus**) **aequinoctialis** (Herbst, 1790) — Sporadic. Sampling period: IV–V. months. Sampling place: S-1.

**Rhizotrogus aestivus** (Olivier, 1789) — Very common in dung of cow. Sampling period: IV–VI months. Sampling place: S-1, S-2, S-3, S-4.

**Amphimallon solstitialis** (Linné, 1758) — Widespread. Sampling period: V–VII months. Sampling place: S-1, S-2.

**Amphimallon assimilis** (Herbst, 1790) — Rare. Sampling period: VI. month. Sampling place: S-1.

**Melolontha pectoralis** Megerle, 1812 — Very rare. Sampling date: 1992. V. 4. Sampling place: S-3.

**Melolontha melolontha** (Linné, 1758) — Very common, abundant in every third year. Sampling period: III–V. months. Sampling place: S-2, S-3, S-4, S-5.

**Melolontha hippocastani** Fabricius, 1801 — Very common, abundant in every third year. Sampling period: IV–V. months. Sampling place: S-3, S-4.

**Polyphylla fullo** (Linné, 1758) — Sporadic. Sampling period: VII. month. Sampling place: S-1, S-2.

**Anoxia pilosa** (Fabricius, 1792) — Common. Sampling period: VI. month. Sampling place: S-1.

**Hoplia farinosa** (L., 1761) (= *H. philanthus* Sulzer: Endrödi 1956) — Very rare. Sampling date: 1991. VI. 7. Sampling place: S-1.



**Anomala dubia** (Scopoli, 1763) — Widespread, but nowhere abundant. Sampling period: VI–VII. months. Sampling place: S-1, S-2.

**Anomala vitis** (Fabricius, 1775) — Widespread, but nowhere abundant. Sampling period: VI–VIII. months. Sampling place: S-1, S-2.

**Phyllopertha horticola** (Linné, 1758) — Common. Sampling period: V–VII. months. Sampling place: S-3.

**Anisoplia segetum** (Herbst, 1783) — Common. Sampling period: VI. month. Sampling place: S-1.

**Anisoplia tempestiva** (Erichson, 1847) — Widespread. Sampling period: VII. month. Sampling place: S-1.

**Oryctes nasicornis** Minck, 1914 — At some places abundant. Sampling period: V–VI. months. Sampling place: S-4, S-5.

**Epicometis** (= **Tropinota**) **hirta** (Poda, 1761) — Very common. Sampling period: III–VIII. months. Sampling place: S-1, S-2, S-3, S-4, S-5.

**Oxythyrea funesta** (Poda, 1761) — Common. Sampling period: V–VIII. months. Sampling place: S-1, S-2, S-3, S-4, S-5.

**Cetonia aurata** (Linné, 1758) — Very common. Sampling period: IV–VIII. months. Sampling place: S-1, S-2, S-3, S-4, S-5.

**Liocola lugubris** (Herbst, 1785) — Sporadic. Sampling period: VI–VII. months. Sampling place: S-3, S-4.

**Potosia aeruginosa** (Drury, 1770) — Widespread in oak and willow woods. Sampling period: VI–VII. months. Sampling place: S-3, S-5.

**Potosia affinis** (Andersch, 1797) — Very sporadic. Sampling period: VI–VIII. months. Sampling place: S-3, S-4.

**Potosia cuprea** (Fabricius, 1775) — Very common, first of all in May and Juni. Sampling period: V–VIII. months. Sampling place: S-2, S-3, S-4.

**Potosia fieberi** (Kraatz, 1880) — Very rare. Sampling period: VI–VII. months. Sampling place: S-3.

**Potosia hungarica** (Herbst, 1790) — Common. Sampling period: IV–V, VIII. months. Sampling place: S-2, S-4.

**Valgus hemipterus** (Linné, 1758) — Common. Sampling period: IV–VIII. months. Sampling place: S-2.

**Trichius sexualis** Bedel, 1906 — Very rare. Sampling date: 1991. VIII. 17. Sampling place: S-3.

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