Folia Fac. Sci. Nat. Univ. Masarykianae Brunensis, Biologia 93 (1995): 373-377

Terrestrial Invertebrates of the Pálava Biosphere Reserve of UNESCO, II
Edited by RUDOLF ROZKOŠNÝ & JAROMÍR VAŇHARA

Coleoptera: Staphylinoidea 1

(Ptiliidae, Agyrtidae & Silphidae)

JAN RŮŽIČKA

Department of Ecology, Faculty of Forestry, Czech Agricultural University, Kamýcká 957, 165 21 Praha 6, Czech Republic

Three families, viz., Ptiliidae, Agyrtidae and Silphidae, are included in this first part of Staphylinoidea. A modern revision of Ptiliidae is still badly needed; recently nobody has studied this family in the Czech Republic. Almost 50 species may occur in Bohemia and Moravia (cf. JELÍNEK 1993) but only 4 spp. are known from the extended Pálava Biosphere Reserve. Agyrtidae were separted from Silphidae relatively recently (LAWRENCE & NEWTON 1982). Four species of Agyrtidae and 23 species of Silphidae (or carrion beetles) have been reported from the Czech Republic (cf. RŮŽIČKA 1993) but only 1 and 18 species, respectively, have been found in the territory of the extended Pálava B.R. Ptiliidae may be identified using the key by BESUCHET & SUNDTE (1971) and all the species from both latter families may be distinguished according to the fairly recent keys by FREUDE (1971) and ŠUSTEK (1981). Larvae and adults of Ptiliidae feed upon spores of moulds and some higher fungi, they are regularly found in decaying vegetable material but also in ant and bird nests, and in burrows of small terrestrial mammals. The Agyrtidae are predators in both larval and adult stages specialized, e.g., for snails or larval agglomerations of Bibionidae (Diptera). Some species display a distict montane character and/or their activity is limited to the winter time. The Silphidae may be divided into two groups: (1) primarily necrophagous larvae and adults (Silphinae, or carrion beetles) with some obligatory or facultatively predaceous (*Phosphuga atrata atrata*, *Xylodrepa qudripunctata*) or even phytophagous forms (*Aclypea*), and (2) burying beetles (Nicrophorinae) with parental care for young larvae (parents utilize carcasses as food for larvae of first one or two instars in a closed crypt (cf. MILNE & MILNE 1976, SCOTT 1990). Adults of the latter group are predaceous. Pitfalls with bait have been known as an effective collecting method for a long time for necrophagous Silphidae in addition to other currently used methods.

Data on the family Ptiliidae have been added by P. DROZD, Institute of Forest Ecology, Mendel University of Agriculture and Forestry, Brno.

History of investigation. Two species of Ptiliidae and two spp. of Silphidae were recorded in Kančí obora nr. Lednice by OBRTEL (1971) and further 6 spp. of both families were found in a reed swamp along the Nesyt Fishpond by the same author (OBRTEL 1972). All other species included in the subjoined list are documented by the specimens found in the collections examined. Moreover, some further species known from the vicinity of the Pálava B.R. may be expected here with certainty. For example, *Nicrophorus investigator* Zetterstedt, 1824, was collected in the Podyjí National Park,

N. vestigator Herschel, 1807, at Mikulovice and *N. antennatus* Reitter, 1885, near Brno.

Remarkable records. *Ablattaria laevigata*, an apparently Submediterranean element reaching middle Germany and southern Poland (ŠUSTEK 1981), is distributed in the Czech Republic only in SE Bohemia and southern Moravia (cf. HÁVA 1995).

Monitoring. The abundance and seasonal dynamics of necrophagous species may be examined by means of periodically emptied pitfall traps baited with ripe cheese or fish meat (cf. NOVÁK 1965, 1966, PETRUŠKA 1968, SHUBECK et al. 1981, ANDERSON 1982, and RŮŽIČKA 1994). Unfortunately, any earlier quantitative samples from southern Moravia are not available for potential comparison.

Conservation. The following four species of burying beetles may be considered to be endangered: *Nicrophorus germanicus*, *N. sepultor*, *N. vestigator*, and *N. antennatus* (the two last species being not recorded in the Pálava B.R. but very probably occurring there, cf. History of investigation). All these species were largely distributed in warm parts of the Czech Republic until the end of the 1950s but have disappeared in many sites and now they are found only rarely throughout Bohemia, though being still fairly common in southern Moravia. Regarding their mobility (see PETRUŠKA 1964), the conservation of relevant ecosystems seems to be most hopeful. Two threatened species of Argytidae and Silphidae in the territory of Austria are mentioned by W. BARRIES in JÄCH (1994).

PUBLISHED SOURCES

1. OBRTEL R., 1971: Soil surface Coleoptera in a lowland forest. Acta Sc. Nat. Brno, 5(7): 1-47.
2. OBRTEL R., 1972: Soil surface Coleoptera in a reed swamp. Acta Sc. Nat. Brno, 6 (9): 1-35.

COLLECTIONS EXAMINED

3. Coll. National Museum, Praha.
4. Coll. Regional Museum, Česká Lípa.
5. Coll. Institute of Forest Ecology, Mendel University of Agriculture and Forestry, J. VAŇHARA leg., J. HLADIL det.
6. Coll. J. ČECH, Regional Museum of Southern Bohemia, České Budějovice.
7. Coll. J. VOLÁK, Regional Museum of Eastern Bohemia, Hradec Králové.
8. Coll. Regional Museum of Eastern Bohemia, Hradec Králové.
9. Coll. J. DEZORT, Moravian Museum, Brno.
10. Coll. I. GRULICH, Moravian Museum, Brno.
11. Coll. P. LAUTERER, Moravian Museum, Brno.
12. Coll. Slovakian National Museum, Bratislava.
13. Coll. L. DANĚK, Jičínská 791/22, 288 00 Nymburk.
14. Coll. J. HÁVA, Šluknovská 319, 190 00 Praha 9 - Prosek.
15. Coll. A. HOLUB, Prachatická 21, 370 05 České Budějovice.
16. Coll. I. JENIŠ, 783 32 Náklo 342.
17. Coll. J. JURČÍČEK, Pospíšilova 1, 130 00 Praha 3.

18. Coll. Z. KAČENKA, Okružní 2712, 413 01 Roudnice nad Labem.
19. Coll. V. KARAS, Tyršova čtvrť 564, 391 82 Veselí nad Lužnicí.
20. Coll. L. KOLONIČNÝ, L. Hosáka 7/998. 705 00 Ostrava.
21. Coll. J. KRÁTKÝ, Jungmannova 1441, 500 05 Hradec Králové.
22. Coll. M. KUBOŇ, Jar. Matuška 1/27, 705 00 Ostrava-Dubina.
23. Coll. J. MIČKA, Ružinovská 1163, 142 00 Praha 4.
24. Coll. V. MIKUDA, Smetanova 8/1600, 370 00 České Budějovice.
25. Coll. J. RŮŽIČKA, Pod Královkou 7, 169 00 Praha 6.
26. Coll. R. SAUER, Vitošská 3410/1, 143 00 Praha 4.
27. Coll. J. SCHNEIDER, Lipová 15, 120 00 Praha 2.
28. Coll. J. STANOVSKÝ, Na výspě 18, 704 00 Ostrava-Vyškovice.
29. Coll. J. VÁVRA, B. Václavka 12, 700 30 Ostrava 30.
30. Coll. P. VONIČKA, Ruprechtická 15/533, 460 01 Liberec.

ABBREVIATIONS

General abbreviations: see comments on abbreviations (pp. 13-19) and a separate Appendix.

Example : *Agyrtes castaneus* (Fabricius, 1792): PV[1] (3)[2], 2.0[3], pr[4], CEU[5].

Explanation: [1]locality, [2]number of source, [3]ecosystem or habitat type, [4]trophic relation, [5]distribution.

LIST OF SPECIES

PTILIIDAE

Acrotrichis atomaria (De Geer, 1774): KA (1), 1.1.2, my, EUR.

A. sericans (Heer, 1841): NT (2), 2.1.5, eu, CEU.

Ptenidium pusillum (Gyllenhal, 1808): KA (1), NT (2), 1.1.2, my, W PAL.

Smicrus filicornis (Fairmaire & Laboulbèñe, 1854): HL (5), 1.1.2, my, EUR.

AGYRTIDAE

Agyrtes castaneus (Fabricius, 1792): PV (3, 7, 25, 27), LE (11), VA (20), 2.0, pr, CEU.

SILPHIDAE

Ablattaria laevigata (Fabricius, 1775): PV (3), LE (6), MI (13), 2.0, pr, SBM.

Aclypea opaca (Linneaus, 1758): LD (16, 17), 2.0, ph, HOL.

A. undata (O.F. Müller, 1776): PV (4), HV (15), 2.0, ph, W PAL.

Necrodes littoralis (Linneaus, 1758): PO (3), LE (3, 4, 6), BU (29), ne, PAL.

Nicrophorus fossor fossor Erichson, 1837: NT (2), PV (3, 4), HV (7), BR (10), ne-pr, PAL.

N. germanicus (Linneaus, 1758): BR (23, 25), 2.0, ne-pr, W PAL, EN.

N. humator Olivier, 1790: LE (25), BU (29), ne-pr, W PAL.

N. sepultor Charpentier, 1825: LE (14), ne-pr, EUA, EN.

N. vespillo (Linneaus, 1758): NT (2), KP (3), LE (3, 18, 25, 27, 30), HV (7), BL (8), BR (10), LA (25), ne-pr, PAL.

N. vespilloides Herbst, 1784: KA (1), LE (18, 25), ne-pr, HOL.

Oiceoptoma thoracica (Linneaus, 1758): KA (1), LR (3), PV (4), BR (10, 16, 25), MI (13), HV (15), LE (25), ne, PAL.

Phosphuga atrata atrata (Linneaus, 1758): NT (2), PO (3), LE (3, 10, 24, 25), VA (7), PV (8, 17, 27), BR (25),

DO (26), 1.0, pr, PAL.

Silpha carinata Herbst, 1783: LR (3), PV (3, 4, 6, 7, 12, 21), HV (7, 15), LE (19), DV (22), 2.0, pp-ne, EUA.

S. obscura obscura Linneaus, 1758: LE (3, 30), PV (4, 11), MI (13), HV (15), DV (22), BR (25), VA (28), 2.0, pp-ne, EUA.

S. tristis Illiger, 1798: NT (2), LE (6), LD (10), 2.1.5, 2.2.1, pp-ne, W PAL.

Thanatophilus rugosus (Linneaus, 1758): PO (3), LE (3, 25, 26, 27), PV (4, 10), BR, NT, VA (25), BU (29), 2.0, ne, PAL.

T. sinuatus (Fabricius, 1775): PO (3), LE (3, 25), LR (7), MI (13), BU (29), 2.0, ne, PAL.

Xylodrepa quadripunctata (Linneaus, 1761): KP, LE (3), BR (6, 23), PV (7), DV (9), BU (25), 1.1, pr, EUR (SBM).

REFERENCES

(see also Published sources)

ANDERSON R.S., 1982: Resource partitioning in the carrion beetle (Coleoptera: Silphidae) fauna of southern Ontario: ecological and evolutionary considerations. Can. J. Zool., 60: 1314-1325.

BESUCHET C. & SUNDTE E., 1971: Ptiliidae. In: FREUDE H., HARDE K.W. & LOHSE G.A. (eds.), Die Käfer Mitteleuropas. Vol. 3. Adephaga 2, Palpicornia, Histeroidea, Staphylinoidea 1. Goecke & Evers, Krefeld, pp. 311-342.

FREUDE H., 1971: Silphidae. In: FREUDE H., HARDE K.W. & LOHSE G.A. (eds.), Die Käfer Mitteleuropas. Vol. 3. Adephaga 2, Palpicornia, Histeroidea, Staphylinoidea 1. Goecke & Evers, Krefeld, pp. 190-201.

HÁVA J., 1995: Faunistic records from the Czech Republic - 26. Coleoptera: Silphidae. Klapalekiana, 31: 70.

JÄCH M.A., 1994: Rote Liste der gefährdeten Käfer Österreichs (Coleoptera). In: GEPP J. (ed.), Rote Listen gefährdeter Tiere Österreichs. Vol. 2. Bundesministerium für Umwelt, Jugend und Familie, Graz, pp. 107-200.

LAWRENCE J.F. & NEWTON A.F., 1982: Evolution and classification of beetles. Ann. Rev. Ecol. Syst., 13: 261-290.

MILNE J.L. & MILNE M.J., 1976: The social behaviour of burying beetles. Sci. Am., 235: 84-90.

NOVÁK B., 1965: Dynamika populací brouků ze skupiny Silphiini (Coleoptera). Zur Faunistik und Ökologie der Totengräber in der Feldbiotopen von Haná (Coleoptera Silphidae). Acta Univ. Palackianae Olomuc., Fac. Rer. Nat., 19: 121-152. (In Czech, Germ. summ.).

NOVÁK B., 1966: Faunisticko-ekologická studie o hrobařících z polních biotopů Hané (Col., Silphidae). Populationsdynamik der Silphini (Coleoptera). Acta Univ. Palackianae Olomuc., Fac. Rer. Nat., 22: 129-146. (In Czech, Germ. summ.).

PETRUŠKA F., 1964: Příspěvek k poznání pohyblivosti několika druhů brouků nalétávajících na mršiny (Col., Silphidae et Histeridae). Beitrag zur Bewegungsaktivität einiger Aaskäfer-Arten (Col. Silphidae et Histeridae). Acta Univ. Palackianae Olomuc., Fac. Rer. Nat., 16: 159-189. (In Czech, Russ. & Germ. summ.).

PETRUŠKA F., 1968: Hrobařici jako součást entomofauny polí Uničovské roviny (Col., Silphidae). The carrion-beetles as a component part of the insect fauna of the field in the Uničov plain (Col. Silphidae). Acta Univ. Palackianae Olomuc., Fac. Rer. Nat. 28: 159-187. (In Czech, Engl. summ.).

RŮŽIČKA J., 1993: Agyrtidae, Silphidae. In: JELÍNEK J. (ed.), Check-list of Czechoslovak Insects IV (Coleoptera). Seznam československých brouků. Folia Heyrovskyana, Suppl. 1: 33-34. (In Engl. & Czech).

RŮŽIČKA J., 1994: Seasonal activity and habitat associations of Silphidae and Leiodidae: Cholevinae (Coleoptera) in central Bohemia. Acta Soc. Zool. Bohem., 58: 67-78.

SCOTT M. P., 1990: Brood guarding and the evolution of male parental care in burying beetles. Behav. Ecol. Sociobiol., 26: 31-39.

SHUBECK P.P., DOWNIE N.M., WENZEL R.L. & PECK S.B., 1981: Species composition and seasonal abundance of carrion beetles in an oak-beech forest in the Great Swamp National Wildlife Refuge (N.J.). Ent. News, 92: 7-16.

ŠUSTEK Z., 1981. Mrchožroutovití Československa (Coleoptera, Silphidae). /Carrion beetles of Czechoslovakia/. Zprávy Čs. spol. ent. ČSAV, Praha. Klíče k určování hmyzu /Keys to the identification of insects/, 2: 1-46. (In Czech).

Folia Fac. Sci. Nat. Univ. Masarykianae Brunensis, Biologia 92-93 (1995)
Terrestrial Invertebrates of the Pálava Biosphere Reserve of UNESCO
Edited by RUDOLF ROZKOŠNÝ & JAROMÍR VAŇHARA

APPENDIX: 2

General Abbreviations

Ecosystem and habitat types

1.0	Woodland ecosystems and habitats
1.1	Natural and semi-natural woodlands
1.1.1	Woodlands outside alluvium
1.1.1.1	Cornel oakwoods (*Corni-Querceta pubescentis)*
1.1.1.2	Maple-cornel oakwoods (*Corni-Querceta pubescentis aceris)*
1.1.1.3	Beech-oakwoods (*Fagi-Querceta*)
1.1.1.4	Maple-hornbeam oakwoods (*Carpini-Querceta aceris*)
1.1.1.5	Hornbeam oakwoods(*Carpini-Querceta*)
1.1.1.6	Lime maple woods (*Tili-Acereta*)
1.1.2	Floodplain forests and shore growths
1.1.2.1	Willow alder groves (*Salici-Alneta*)
1.1.2.2	Oak-ash woods (*Querci-Fraxineta*)
1.1.2.3	Poplar-elm ash woods (*Ulmi-Fraxineta populi*)
1.1.2.4	Hardwood-elm ash woods (*Ulmi-Fraxineta carpini*)
1.2	Cultivated woodlands
1.2.1	Mixed forests
1.2.2	Spruce stands
1.2.3	Scots pine stands
1.2.4	Black locust stands
1.2.5	Windbreaks
1.2.6	Parks
1.2.7	Alleys
2.0	Non-woodland ecosystems and habitats
2.1	Natural and supplementary non- wood land habitats
2.1.1	Limestone rocks and scree
2.1.2	Rocky steppe
2.1.3	Grassy steppe
2.1.4	Sandy habitats
2.1.5	Littoral habitats and swamps
2.1.6	Halophilous habitats
2.2	Non-woodland habitats in cultivated landscape
2.2.1	Flooded (floodplain) meadows
2.2.2	Non-flooded meadows
2.2.3	Fields
2.2.4	Field balks and paths
2.2.5	Vineyards
2.2.6	Orchards
2.2.7	Gardens
2.2.8	Ruderal and other degraded habitats

Ecological characteristics

eu	euryoecious
hg	hygrophilous
me	mesophilous
ps	psychrophilous
sk	skiophilous
tf	thermophilous
xt	xerothermic

Trophic relations

co	coprophagous
mo	monophagous
my	mycophagous
ne	necrophagous
ol	oligophagous
pa	parasitic, parasitoid
ph	phytophagous
po	polyphagous within ph
pp	polyphagous
pr	predatory
sa	saprophagous
xy	xylophagous

Abundance

A1	very rare
A2	rare
A3	fairly numerous
A4	numerous
A5	very numerous

Frequency

F1	very scarce
F2	scarce
F3	medium frequent
F4	frequent
F5	very frequent

Distribution

ATL	Atlantic
CEU	Central European
COS	Cosmopolitan
EUA	Eurasian
EUR	European
EUS	Eurosiberian
HOL	Holarctic
PAL	Palaearctic
PON	Pontic
SBB	Subboreal
SBM	Submediterranean
TUR	Turanic

Species conservation

EX	extinct
CR	critically endangered
EN	endangered
VU	vulnerable

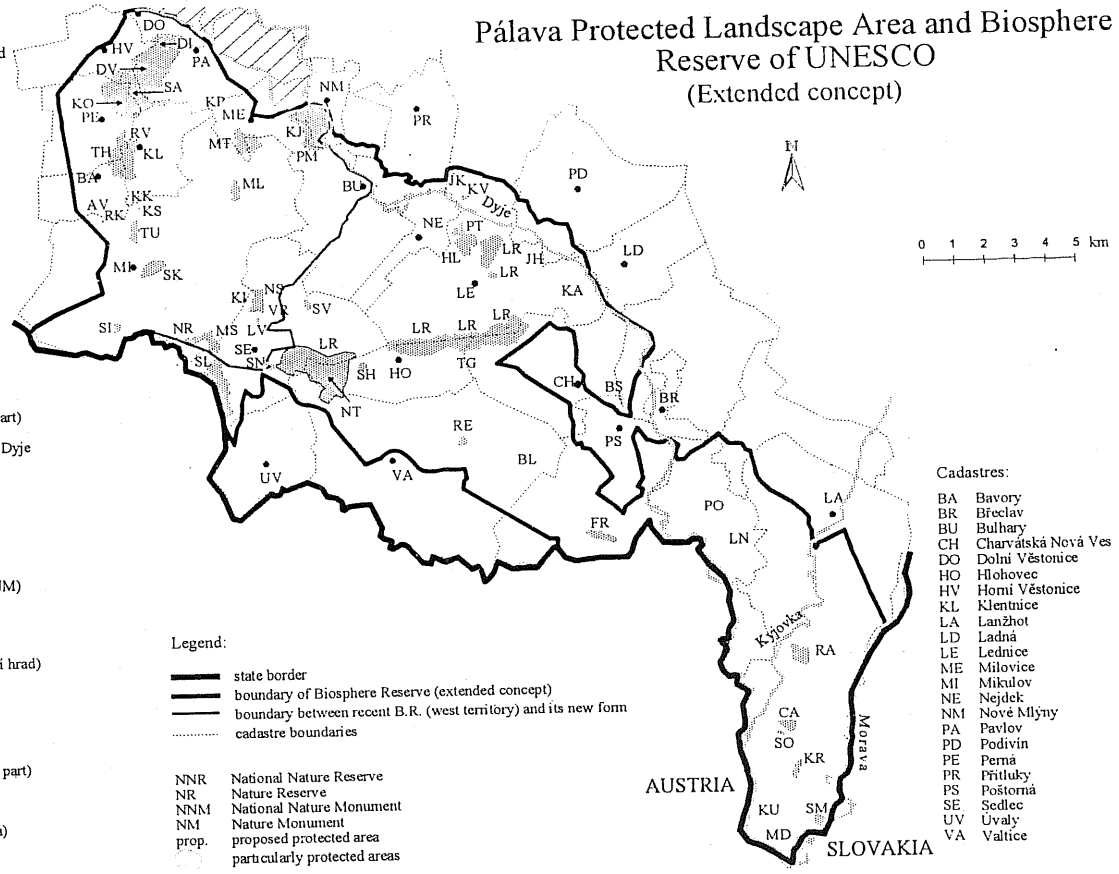
*species occurring only in Pálava B.R. (within the Czech Republic)

APPENDIX: 1

Particularly protected areas and local names:

AV Anenský vrch (NM)
BL Boří les
BS Bruksa (prop.)
CA Cahnov (NNR, part)
DI Děvičky (Divčí hrady)
DV Děvín (NNR, part)
FR Františkův rybník (NR)
HL Horní les nr. Lednice
JH Janův hrad
JK Jezírko Kutnar (NM)
KA Kančí obora nr. Lednice
KI Kinberk (prop.)
KJ Křivé jezero (NNR)
KK Kočičí kámen (NM)
KO Kotel (NNR, part)
KP Klentnický potok valley
KR Krumpava (prop.)
KS Kočičí skála (NM)
KU Košárské louky
KV Květné jezero (NM)
LN Lány
LR Lednické rybníky (NNR, part)
LV Liščí vrch (NR)
MD confluence of Morava and Dyje
ML Milovický les (prop.)
MS Mušlov
MT Milovická stráň (NR)
NR Nový rybník (prop.)
NS Nad střelnicí (prop.)
NT Nesyt (LR part)
PM Panenský Mlýn
PO Pohansko
PT Pastvisko nr. Lednice (NNM)
PV Pavlovské vrchy (Pálava)
RA Ranšpurk (NNR)
RE Rendesvous (NNM)
RK Růžový kopec (NM)
RV Růžový vrch (NR) (Sirotčí hrad)
SA Soutěska (NNR, part)
SH Stará hora (prop.)
SI Šibeničník (NR)
SK Svatý Kopeček (NR)
SL Skalky (prop.)
SM Sekulská Morava (prop.)
SN Slanisko nr. Nesyt (NNR, part)
SO Soutok (NNR, part)
SV Studánkový vrch (prop.)
TG Tři grácie
TH Tabulová (NNR) (Stolová)
TU Turold (NR)
VR Vysoký roh

Pálava Protected Landscape Area and Biosphere Reserve of UNESCO
(Extended concept)



Legend:

- state border
- boundary of Biosphere Reserve (extended concept)
- boundary between recent B.R. (west territory) and its new form
- cadastre boundaries

NNR National Nature Reserve
NR Nature Reserve
NNM National Nature Monument
NM Nature Monument
prop. proposed protected area
particularly protected areas

Cadastres:

BA Bavory
BR Břeclav
BU Bulhary
CH Charvátská Nová Ves
DO Dolní Věstonice
HO Hlohovec
HV Horní Věstonice
KL Klentnice
LA Lanžhot
LD Ladná
LE Lednice
ME Milovice
MI Mikulov
NE Nejdek
NM Nové Mlýny
PA Pavlov
PD Podivín
PE Perná
PR Přítluky
PS Poštorná
SE Sedlec
UV Úvaly
VA Valtice