

Beetles in polypores of the Moscow region: checklist and ecological notes

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Polypore inhabiting beetles in the Moscow region were studied. Sixty-one polypore species harboured 261 species of beetles (174 species coming to polypores as imago, 87 species developing in polypores at larval stage). The highest number of species was found in polypores growing on deciduous trees: *Fomes fomentarius* (102 beetle species), *Polyporus squamosus* (94 species), *Laetiporus sulphureus* (81 species) and *Piptoporus betulinus* (62 species). Imaginal species diversity is much higher than larval, although the later can be more abundant. *Ennearthron cornutum* (found on 20 species of polypores) and *Cis comptus* (16 species) occurred in the largest number of fungal species.

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1. Introduction

Polypore fungi are a specific group of wood-decomposing Basidiomycetes and an important component of the food chains based on dead wood. One of the main features of polypores is the ability to produce rather large and strong fruiting bodies, which are big and persistent enough to attract and host mycetobiont insects.

Beetles inhabiting polypore fungi are an important part of forest ecosystem, recycling fruiting bodies and being involved in the spore dispersal of the wood-rotting fungi. The beetle fauna of the Moscow (administrative, ~ 54°15'–56°52' N, 35°8'–40°14' E) region is now rather well known (Nikitsky *et al.* 1995, 1996, 1998, 2001, 2002) but the ecology of beetles inhabiting

polypores, their host preferences and feeding habits, and beetle complexes in certain polypore species have not been frequently investigated.

Active studies on the biology of mycetophilous beetles started in the 1930's (Donisthorpe 1931, 1935, Benick 1952, Palm 1959, Paviour-Smith 1960). General data on mycetophilous beetles for the European part of Russia were collected by Nikitsky (1989, 1993), Kompantsev (1982, 1984) and Kompantseva (1987a–c). Krasutsky (1990, 1996, 1997, 2000) carried out extensive studies of basidiomycete inhabiting beetles in Ural mountains and Western Siberia. Most of the works in Russia focused on the feeding preferences of single beetle species. However, much is still unknown on both the food preferences of certain species, and on the beetle fauna

of certain polypores. Fungus–beetle interactions are particularly poorly known. In this paper we summarize data on beetle inhabitants of polypore fungi of the Moscow region.

2. Material and methods

Field studies were carried out in 1995–1998 in different parts of the Moscow region. The majority of the field material was collected in coniferous and spruce-deciduous mixed forests. The predominant tree species in the region are *Picea abies* (L.) Karst., *Pinus sylvestris* L., *Betula pendula* Roth., *Betula pubescens* Ehrh., *Populus tremula* L., *Tilia cordata* Mill., *Alnus glutinosa* Gaertn., *Salix* spp. and *Quercus robur* L.

Imago and larvae were collected and preserved (larvae in 70% alcohol) for further identification. Fruiting bodies with beetle larvae were taken in plastic bags and boxes together with substrate for rearing, kept for 2–3 months in +4° C, and then exposed in room temperature for further two months before the checking of the rearing results.

Beetle specimens, preserved in the Zoological Museum of the Moscow State University were studied. Beetle and polypore specimens are preserved in the Zoological Museum of the Moscow State University and partly at the Department of Entomology, Biological Faculty, Moscow State University. Fungal identification was performed by Dr. T. N. Barsukova and Dr. M. A. Bondartseva. Fungal nomenclature follows Niemelä (2001), names which are not included in this book are given according to Bondartseva & Parmasto (1986) and Bondartseva (1998). Beetle nomenclature is given according to Silfverberg (1992) and Nikitsky *et al.* (1996, 1998, 2001).

3. Results

Analysis included 261 species of mycetophilous beetles (Appendix) linked to 61 polypore species. Larvae of staphylinid beetles are still not well known and in many cases they are difficult to identify, thus they are not included in our study. The list of polypore species below is given in an alphabetic order because the systematics of the

Basidiomycetes is still unsettled and no good division into families can be made. Beetle lists (cases with both imago and larvae reared were treated separately from those with only imago collected) within each ecological group in every fungal host are given in an alphabetic order within each family without family name specifications. The “imago only” group included also beetles collected on polypore basidiocarps covered by anamorphic fungi, those came during the polypore sporulation period, and possibly, visitors of myxomycete plasmodia, covering polypores. Larvae of these beetles were not studied. A full systematic list of beetles found is given in Appendix.

Our aim was to document beetles separately in all the taxonomically-complicated or difficult groups of polypore species, including as detailed identification of the fungus as possible. Several valid species have been described on the basis of taxa originally published as forms, and it is easy to summarise data on two fungal host species, but no way to re-divide them, if documented collectively.

Unfortunately, in some cases (*Daedaleopsis confragosa* – *Daedaleopsis tricolor*; *Trametes velutina* – *T. pubescens*; *Heterobasidion annosum* – *H. parviporum*; *Phellinus igniarius* – *P. nigricans* – *P. cinereus*) information on some species had to be given collectively because of recent changes in polypore systematics or because the species was given in a wide sense. The number of studied fruiting bodies of each polypore species is given in parentheses after the species name. We studied only inhabited fruiting bodies.

3.1. *Antrodia serialis* (Fr.) Donk (70)

Larvae and imago reared: *Epuraea variegata*.

3.2. *Bjerkandera adusta* (Willd.: Fr.) P. Karst. (221)

Larvae and imago reared: *Dacne bipustulata*, *C. comptus*, *Ennearthron cornutum*, *Sulcacis fronticornis*, *S. affinis*, *Mycetophagus quadripustulatus*, *M. ater*, *M. piceus*. (Type specimens of the related species *Mycetophagus salicis* Brisout de Barneville, 1862, preserved in Museum d’Histoire Naturelle Entomologie, Paris

were not studied. Only *Mycetophagus piceus* (Fabricius, 1777) name is used.)

Imago only: *Acrulia inflata*, *Atheta britanniae*, *A. crassicornis*, *A. fungi*, *A. pallidicornis*, *Dinaraea aequata*, *Proteinus brachypterus*, *Scaphidium quadrimaculatum*, *Scaphisoma agaricinum*, *S. boleti*, *S. subalpinum*, *Thymalus oblongus*, *Cerylon deplatanum*, *Orthoperus rogeri*, *Tetratoma ancora*.

3.3. *Cerrena unicolor* (Bull.: Fr.) Murrill (83)

Larvae and imago reared: *C. comptus*, *C. hispidus*, *C. micans*, *Sulcaxis affinis*, *S. fronticornis*.

Imago only: *Scaphidium quadrimaculatum*, *Scaphisoma agaricinum*, *Thymalus oblongus*, *Epuraea variegata*, *Cerylon ferrugineum*, *Scaphidema metallicum*.

3.4. *Climacocystis borealis* (Fr.) Kotl. & Pouzar (35)

Larvae and imago reared: *Cis comptus*, *Ennearthron cornutum*, *E. laricinum*, *Mycetophagus multipunctatus*, *Diaperis boleti*.

Imago only: *Corticaria longicollis*, *Latridius minutus*, *Cryptophagus badius*, *Orthoperus corticalis*.

3.5. *Daedalea quercina* Fr. (125)

Imago only: *Atheta pallidicornis*, *Bolitochara obliqua*, *B. pulchra*, *Gyrophana strictula*, *Phloeocharis subtilissima*, *Scaphisoma agaricinum*, *S. balcanicum*, *S. subalpinum*, *Thymalus oblongus*.

3.6. *Daedaleopsis confragosa* (Bolton.: Fr.) J. Schröt.

3.7. *Daedaleopsis tricolor* (Bull.: Fr.) Bondartsev & Singer (220)

Larvae and imago reared: *Cis comptus*, *Ennearthron cornutum*, *Sulcaxis fronticornis*, *Thymalus oblongus*, *Epuraea distincta*, *Mycetophagus multipunctatus*, *M. piceus*, *Litaragus connexus*.

Imago only: *Anisotoma humeralis*, *Agaricochara latissima*, *Gyrophana strictula*, *Oligota granaria*, *Cerylon histeroides*, *Dienerella filum*,

Mycetophagus ater, *M. quadripustulatus*.

Separate collections for these two polypore species are still few. In addition to *D. tricolor* the following larvae and imagos were recorded: *Dacne bipustulata*, *Tritoma subbasalis*, *Cis boleti*, *C. comptus*, *Ennearthron cornutum*.

3.8. *Datronia mollis* (Sommerf.: Fr.) Donk (50)

Larvae and imago reared: *Ennearthron cornutum*.

Imago only: *Cyllodes ater*.

3.9. *Fistulina hepatica* Schaeff.: Fr. (12)

Larvae and imago reared: *Dacne bipustulata*, *Triphyllus bicolor*.

Imago only: *Megarthus hemipterus*, *Proteinus atomarius*, *Velleius dilatatus*, *Epuraea contractula*, *Cryptophagus abietis*. *Cryptophagus pubescens* was found once.

3.10. *Fomes fomentarius* (L.: Fr.) Fr. (823)

Many beetle species live in the basidiocarps of this polypore. However, only some of them could be found in the fruiting bodies at the larval stage.

Larvae and imago reared: *Sepedophilus bipustulatus*, *S. marshami*, *S. pedicularius*, *Dorcotoma dresdensis*, *D. lomnickii*, *D. robusta*, *Cis glabratus* (untypical host), *C. jacquemartii* (the predominant *Cis* species), *C. lineatocribratus*, *C. alter*, *Ennearthron cornutum*, *Ropalodontus strandi* (see footnote in Appendix), *Bolitochara reticulata*, *Neomida haemorrhoidalis*.

Epuraea variegata and *E. biguttata* were reared from decomposed fruiting bodies.

The larvae of *Leiestes seminigra*, *Melandrya dubia*, *Tomoxia bucephala*, *Variimorda villosa* and *Upis ceramboides* develop in the white rot caused by this fungus.

Imago only: *Agathidium confusum* (N. N. Kotelenets unpubl.), *A. laevigatum* (rather rare), *A. nigripenne*, *A. rotundatum*, *Amphicyllis globus*, *Anisotoma axillaris*, *A. castanea*, *A. glabra* (N. N. Kotelenets unpubl.), *A. humeralis*, *Acrulia inflata*, *Atheta boletophila*, *A. fungi*, *A. nigricornis*, *A. pallidicornis*, *A. paracrassicornis*, *A. picipes*, *A. pittionii*, *A. sodalis*, *Bolitochara*

mulsanti, *B. obliqua*, *B. pulchra*, *Caryoscapa limbatum*, *Dinaraea aequata*, *Euryusa castanoptera*, *Gyrophæna affinis*, *G. fasciata*, *G. manca*, *G. nana*, *G. strictula*, *Haploglossa villosula*, *Leptusa pulchella*, *Placusa tachyporoides*, *Phymatura brevicollis*, *Scaphidium quadrimaculatum*, *Scaphisoma agaricinum*, *S. boreale*, *S. subalpinum*, *Sepedophilus littoreus*, *Peltis grossa*, *Cyllodes ater*, *Epuraea concurrens*, *E. contractula*, *E. limbata*, *E. silacea*, *E. unicolor*, *Glischrochilus grandis*, *G. hortensis*, *Pocadius ferrugineus*, *Rhizophagus bipustulatus*, *R. dispar*, *R. parvulus*, *Aspidiphorus orbiculatus*, *Atomaria alpina*, *Cryptophagus setulosus*, *Triplax russica*, *Cerylon deplanatum*, *C. ferrugineum*, *C. histeroides*, *Orthoperus corticalis*, *Corticaria elongata*, *C. impressa*, *C. lapponica*, *C. rubripes*, *Corticaria gibbosa*, *Dienereella filum*, *Enicmus rugosus*, *E. fungicola*, *Latridius brevicollis*, *L. consimilis*, *L. hirtus*, *L. minutus*, *Bitoma crenata*, *Litargus connexus*, *Mycetophagus ater*, *M. decempunctatus*, *M. piceus*, *M. quadripustulatus*, *Tetratoma ancora*, *Melandrya dubia*, *Orchesia micans*. Single finds of *Cyphea curtula*, *Cyphon pubescens* and *Upis ceram-boides* were made.

3.11. Fomitopsis pinicola (J. Sowerby: Fr.) P. Karst. (820)

Larvae and imago reared: *Dorcatoma punctulata* (in Moscow region living almost exclusively in the fruiting bodies of this common fungus), *Cis alter*, *C. glabratus*, *C. Jacquemartii*, *Ennearthron cornutum*, *E. laricinum*, *Diaperis boleti*.

Larvae of *Peltis grossa* and *Ostoma ferruginea* are feeding mostly on brown rot caused by the mycelium of this polypore, but sometimes they can inhabit the basidiocarps as well.

Imago only: *Anisotoma humeralis*, *A. castanea* [these two species were found by N. N. Kotelenets (unpubl.)], *Bolitochara mulsanti*, *B. obliqua*, *Dinaraea aequata*, *Phymatura brevicollis*, *Placusa tachyporoides*, *Scaphisoma agaricinum*, *S. boleti*, *S. inopinatum*, *S. subalpinum*, *Grynocharis oblonga*, *Ostoma ferruginea*, *Peltis grossa*, *Thymalus oblongus*, *Cyllodes ater*, *Epuraea variegata*, *E. concurrens*, *Pocadius ferrugineus*, *Atomaria alpina*, *Pteryngium crenatum*. The most abundant spe-

cies on the hymenophore surface is *Gyrophæna boleti*.

3.12. Funalia trogii (Berk.) Bondartsev & Singer (290)

Larvae and imago reared: *Tritoma bipustulata*, *Cis comptus*, *Ennearthron cornutum*, *E. laricinum*, *Octotemnus glabriculus*, *Sulcaxis affinis*, *S. bidentulus*.

Imago only: *Dinaraea aequata*, *Gyrophæna manca*, *Scaphisoma balcanicum*, *S. boreale*.

3.13. Ganoderma lipsiense (Batsch) G. F. Atk. (692) (= Ganoderma applanatum (Pers.) Pat.)

Larvae and imago reared: *Dorcatoma dresdensis* (mostly on *Alnus*), *D. lomnickii*, *Epuraea variegata*, *Cis Jacquemartii*, *C. alter*, *Ennearthron cornutum*, *Mycetophagus decempunctatus*, *M. piceus*.

Neomida haemorrhoidalis can also develop in this fungus, but the main substrate for larvae is *Fomes fomentarius*. A single rearing of *Cis comptus* was obtained.

Imago only: *Aleochara moerens*, *Atheta aeneipennis*, *A. crassicornis*, *A. diversa*, *A. euryptera*, *A. fungi*, *A. pallidicornis*, *A. paracrassicornis*, *A. pilicornis*, *A. pittingii*, *A. sodalis*, *A. subtilis*, *Bolitochara mulsanti*, *Dinaraea aequata*, *D. linearis*, *Gyrophæna fasciata*, *Lordithon thoracicus*, *Scaphisoma agaricinum*, *S. subalpinum*, *Atomaria apicalis*, *Cerylon fagi*, *C. ferrugineum*. Single imago of *Scaphisoma boreale* collected.

3.14. Gloeophyllum abietinum (Bull.: Fr.) P. Karst. (93)

Larvae and imago reared: *Curtimorda bisignata* (more common in this fungus, than in the other *Gloeophyllum* species), *C. maculosa*. Larvae pupate in the brown rotted wood under the fruiting bodies.

3.15. Gloeophyllum protractum (Fr.) Imazeki (82)

Larvae and imago reared: *Curtimorda bisignata*, *C. maculosa*.

**3.16. *Gloeophyllum sepiarium* (Wulfen: Fr.)
P. Karst. (102)**

Larvae and imago reared: *Curtimorda bisignata*, *C. maculosa*. Larvae pupate in the brown rotted wood under the fruiting bodies.

**3.17. *Gloeophyllum trabeum* (Pers.: Fr.)
Murrill (82)**

Larvae and imago reared: *Curtimorda bisignata*. Host fungus is yet to be confirmed.

**3.18. *Hapalopilus rutilans* (Pers.: Fr.)
P. Karst. (53)**

Larvae and imago reared: *Sulcacis affinis*, *Hallomenus axillaris*, *H. binotatus* (both species develop in the context of fruiting body). Sometimes larvae of *Orchesia fasciata*, living mostly in decayed wood, were found in the fruiting body.

3.19. Genus *Heterobasidion* Bref. (26)

Two polypore species *Heterobasidion annosum* (Fr.) Bref. and *H. parviporum* Niemelä & Korhonen have been separated by Niemelä & Korhonen (1998).

Larvae and imago reared: The only rearing of *Cis lineatocribratus* was done without host tree specification and hence the species of *Heterobasidion* cannot be concluded. Further studies on the beetle fauna of these economically important polypore species are needed.

**3.20. *Hyphodontia paradoxa* (Schrad.: Fr.)
E. Langer & Vesterhoff (91) (= *Schizopora
paradoxa* (Schrad.: Fr.) Donk)**

Larvae and imago reared: *Phryganophilus auritus* larvae develop in the white rot caused by the fungus.

Imago only: *Acrulia inflata*, *Cis comptus*.

**3.21. *Inocutis rheades* (Pers.) Fiasson &
Niemelä (192) (= *Inonotus rheades* (Pers.)
Bondartsev & Singer)**

Larvae and imago reared: *Dorcatoma dresdensis*, *Ennearthron cornutum*, *Mycetophagus piceus*,

Orchesia micans (the predominant species of this fungus in the Moscow region); single rearing of *Tritoma subbasalis* was conducted.

Imago only: *Scaphisoma agaricinum*, *S. subalpinum*, *Cerylon fagi*.

**3.22. *Inonotus dryadeus* (Pers.: Fr.) Murrill
(71)**

Imago only: *Atheta oblita*.

**3.23. *Inonotus hispidus* (Bull.: Fr.) P. Karst.
(82)**

Larvae and imago reared: *Dorcatoma dresdensis*, *Dacne bipustulata*, *Ennearthron cornutum*, *Mycetophagus piceus*, *Orchesia micans*. Larvae of *Anaspis marginicollis* (and some other *Anaspis* species) are mostly restricted to dead wood material, but this species can also develop in the polypore basidiocarps.

Imago only: *Atheta liturata*, *Cryptophagus dentatus*, *Corticaria longicollis*.

3.24. *Inonotus obliquus* (Pers: Fr.) Pilát (89)

Larvae and imago reared: *Dorcatoma dresdensis*, *D. substriata*, *Triplax russica* (larvae collected only at this fungus in the Moscow region), *Ennearthron cornutum*, *Epuraea silacea*, *Mycetophagus ater*, *Mycetophagus decempunctatus* (dominant species in this fungus), *M. piceus*, *M. quadripustulatus*, *Abdera affinis*, *Orchesia micans*. *Globicornis emarginata* larvae were found on a dead fruiting body of this polypore.

Imago only: *Atheta boletophila*, *A. castanoptera*, *Carphacis striatus*, *Megarhtrus hemipterus*, *Scaphisoma agaricinum*, *Lordithon lunulatus*, *Pentanota meuseli* (single individual), *Philonthus succicola*. Rotten basidiocarps also attract *Nicrophorus vespilloides*, *Oiceoptoma thoracica*, *Lordithon exoletus* and *Geotrupes stercorosus*.

**3.25. *Inonotus radiatus* (J. Sowerby: Fr.)
P. Karst. (480)**

Larvae and imago reared: *Dorcatoma dresdensis*, *D. substriata*, *Dacne bipustulata*, *C. glabratus*,

C. jacquemartii, *Ennearthron cornutum*, *Sulcaxis fronticornis*, *Mycetophagus decempunctatus*, *M. multipunctatus*, *M. piceus*, *Abdera affinis*, *A. flexuosa* (both species of *Abdera* develop in the fungus, but the last-mentioned is more common), *Orchesia fusiformis*, *O. micans*. *Globicornis emagrinata* larvae were collected on dried fruiting bodies.

Imago only: *Dinaraea aequata*, *Cryptophagus dentatus*.

3.26. *Laetiporus sulphureus* (Bull.: Fr.) Murrill (460)

Larvae and imago reared: *Dacne bipustulata*, *Ennearthron cornutum*, *Mycetophagus ater*, *M. decempunctatus*, *M. multipunctatus*, *M. piceus*, *Mycetophagus quadripustulatus* (dominant species within this beetle genus), *Hallomenus axillaris*, *H. binotatus*, *Diaperis boleti*, *Eledona agaricola*, *Pentaphyllus testaceus*.

Larvae of *Dorcatoma flavicornis*, *D. chrysomelina* and *Ennearthron palmi* (single find) develop in the brown rot caused by this fungus and can be found in between basidiocarp and wood.

Imago only: *Aleochara sanguinea*, *Anotylus nitidulus*, *Atheta britanniae*, *A. castanoptera*, *A. crassicornis*, *A. celata*, *A. fungi*, *A. gagatina*, *A. liturata*, *A. oblita*, *A. pilicornis*, *A. paracrassicornis*, *A. pittionii*, *A. ravilla*, *A. subtilis*, *Autalia longicornis*, *Gyrophana affinis*, *G. fasciata*, *G. manca*, *G. orientalis*, *G. pulchella*, *Lordithon lunulatus*, *Scaphidium quadrimaculatum*, *Oxypoda alternans*, *Phloeonomus pusillus*, *Proteinus atomarius*, *Quedius cruentus*, *Q. brevicornis*, *Cryptopleurum minutum*, *Ghathoncus buyssoni* (predator), *Pocadius ferrugineus*, *Atomaria apicalis*, *Cryptophagus dentatus*, *C. scanicus*, *C. setulosus*, *Triplax russica*, *Orthoperus atomus*, *O. corticalis*.

Imago on decomposed basidiocarps: *Nicrophorus vespilloides*, *Oiceoptoma thoracica*, *Catops nigricans*, *C. nigrita*, *Sciodrepoides watsoni*, *Atheta dadopora*, *A. harwoodi*, *A. latcollis*, *A. nigricornis*, *A. nigrifula*, *A. sodalis*, *Bolitochara lucida*, *B. pulchra*, *Megarthritis depressus*, *M. hemipterus*, *M. nitidulus*, *Omalium rivulare*, *Philonthus succicola*, *P. carbonarius* (more common than the previous species),

Proteinus macropterus, *Cercyon impressus*, *C. lateralis*, *Megasternum obscurum*, *Geotrupes stercorosus*, *Cis bidentatus*, *Ennearthron larinicum*, *Sulcaxis fronticornis*, *Mycetophagus quadriguttatus*.

Corticaria alleni was collected on the brown rot caused by the fungus.

3.27. *Lenzites betulinus* (L.: Fr.) Fr. (171)

Larvae and imago reared: *Tritoma subbasalis*, *Cis boleti*, *C. comptus*, *C. fissicornis*, *C. hispidus*, *C. micans*, *C. rugulosus*, *Octotemnus glabriculus*, *Sulcaxis affinis*, *Wagaicis wagai*, *Orchesia fusiformis*.

Imago only: *Agathidium seminulum*, *Atheta britanniae*, *Cerylon deplanatum*, *C. histeroides*, *Corticaria serrata*. *Latridius consimilis* individuals were found on decomposed fruiting bodies, *L. hirtus* was found only once.

3.28. *Phellinus alni* (Bondartsev) Parmasto (12)

Larvae and imago reared: *Cis jacquemartii*, *Ennearthron cornutum*, *Sulcaxis fronticornis*.

3.29. *Phellinus igniarius* (L.: Fr.) Quél. (310) (including *P. cinereus* (Niemelä) M. Fischer and *P. nigricans* (Fr.) P. Karst.)

Larvae and imago reared: *Dorcatoma lomnickii*, *D. dresdensis* and *Ennearthron cornutum* are main larval habitats in basidiocarps together with *Cis jacquemartii*, *Abdera affinis* and less frequently *Bolitophagus reticulatus*. *Cis lineatocribratus* was reared only once.

Predator larvae of *Korynetes caeruleus* and *Tillus elongatus* come to the polypore to hunt for the larvae of *Dorcatoma*. *Denticollis linearis* larvae are also predators; typical host for them is rotten wood, from where they can come to the fruiting body and can pupate inside the fungus.

In the white rot caused by the fungus the larvae of *Melandrya dubia* and *Tomoxia bucephala* develop.

Imago only: *Bolitochara obliqua*, *Gyrophana affinis*, *G. bihamata*, *G. fasciata*, *G. joyioides*, *G. manca*, *G. nana*, *G. strictula*, *Lordithon thoracicus*, *Scaphisoma agaricinum*,

Thymalus oblongus, *Atomaria alpina*, *Cryptophagus pseudodentatus*, *Orchesia micans*.

3.30. *Phellinus punctatus* (Fr.) Pilát (31)

Imago only: *Tetratoma ancora*.

3.31. *Phellinus robustus* (P. Karst.) Bourdot & Galzin (78)

Larvae and imago reared: *Cis glabratus*, *Ennearthron cornutum*.

3.32. *Phellinus tremulae* (Bondartsev) Bondartsev & Borissov (198)

Larvae and imago reared: *Dorcatoma dresdensis*, *Cis Jacquemartii*, *Ennearthron cornutum*, *Anaspis arctica*.

Imago only: *Scaphisoma balcanicum*.

3.33. *Piptoporus betulinus* (Bull.: Fr.) P. Karst. (398)

Larvae and imago reared: *Epuraea variegata*, *Dacne bipustulata*, *Cis glabratus*, *C. Jacquemartii*, *C. lineatocribratus*, *Ennearthron cornutum*, *E. laricinum*, *Sulcacis affinis*, *Diaperis boleti*.

In the white rot of the fungus *Leistes seminigra* and *Upis ceramboides* larvae develop.

Imago only: *Agathidium nigripenne* (N. N. Kotelenets unpubl.), *Anisotoma humeralis*, *Agaricochara latissima*, *Atheta britanniae*, *A. castanoptera*, *A. crassicornis*, *A. fungicola*, *A. gagatina*, *A. harwoodi*, *A. nigricornis*, *A. nigritula*, *A. pallidicornis*, *A. picipes*, *A. sodalis*, *Bolitochara mulsanti*, *B. obliqua*, *Dinaraea aequata*, *D. angustula*, *Gyrophaena affinis*, *Homalota plana* (single individual), *Lordithon exoletus*, *L. lunulatus*, *Oxypoda alternans*, *Philonthus fimetarius*, *P. carbonarius*, *P. succicola*, *Phloeocharis subtilissima* (single find), *Proteinus atomarius*, *P. brachypterus*, *Scaphisoma agaricinum*, *S. boleti*, *Thymalus oblongus*, *Cyllodes ater*, *Epuraea silacea*, *Caenoscelis ferruginea*, *Litargus connexus*, *Mycetophagus ater*, *M. piceus*, *M. decempunctatus*, *M. multipunctatus*, *M. quadripustulatus*, *Triphyllus bicolor*, *Tetratoma ancora*.

Imago on decomposed basidiocarps: *Cercyon lateralis*, *Megasternum obscurum*, *Atomaria fuscata*, *Cryptophagus dentatus*, *C. pallidus*, *Latridius consimilis*.

3.34. *Polyporus alveolaris* (DC.: Fr.) Bondartsev & Singer (39)

Imago only: *Tritoma subbasalis*.

3.35. *Polyporus brumalis* (Pers.: Fr.) Fr. (14)

Larvae and imago reared: *Tritoma bipustulata*.

3.36. *Polyporus coronatus* Rostk. (10)

Imago only: *Dinaraea aequata*, *D. angustula*, *Gyrophaena affinis*, *Lordithon lunulatus*.

3.37. *Polyporus melanopus* (Pers.: Fr.) Fr. (29)

Imago only: *Sulcacis bidentulus*.

3.38. *Polyporus squamosus* (Huds.: Fr.) Fr. (362)

Larvae and imago reared: *Epuraea silacea*, *Dacne bipustulata*, *Litargus connexus*, *Mycetophagus ater*, *M. decempunctatus*, *M. piceus*, *M. multipunctatus*, *M. quadripustulatus*, *Diaperis boleti*.

Imago only: *Agathidium seminulum*, *Anopleta corvina*, *Anotylus nitidulus*, *Atheta britanniae*, *A. castanoptera*, *A. celata*, *A. crassicornis*, *A. euryptera* (single individual), *A. fungi*, *A. fungicola*, *A. gagatina*, *A. laticollis*, *A. liturata*, *A. nigra*, *A. nigricornis*, *A. oblita*, *A. pallidicornis*, *A. paracrassicornis*, *A. picipes*, *A. pittionii*, *A. sodalis*, *A. subtilis*, *Bolitochara lucida*, *B. obliqua*, *Dinaraea aequata*, *Gyrophaena affinis*, *G. bihamata*, *G. fasciata*, *G. gentilis*, *G. joyi*, *G. joyioides*, *G. lucidula*, *G. manca*, *G. minima*, *G. nana*, *G. obsoleta*, *G. poweri*, *G. strictula*, *G. transversalis*, *Lordithon lunulatus*, *L. thoracicus*, *Megarthus denticollis*, *M. depressus*, *M. sinuatocollis*, *Oxyporus rufus*, *Philonthus carbonarius*, *P. fimetarius*, *P. succicola*, *Phloeonomus pusillus*, *Proteinus atomarius*, *Quedius cruentus*, *Scaphisoma subalpinum*,

Sepedophilus littoreus, *S. testaceus*, *Nossidium pilosellum*, *Pocadius ferrugineus*, *Atomaria apicalis*, *Cryptophagus scanicus*, *C. setulosus*, *Pteryngium crenatum*, *Triplax russica*, *Cerylon fagi*, *Sericoderus lateralis*, *Hallomenus axillaris*. *Omalius rivulare* is abundant on fruiting bodies in autumn.

Imago on decomposed basidiocarps: *Scioldrepoides fumatus*, *Philonthus subuliformis*, *Proteinus brachypterus*, *P. ovalis*, *Cercyon impressus*, *C. lateralis* (dominant species in the fungus), *Cryptopleurum minutum*, *Megasternum obscurum*, *Epuraea limbata*, *Glischrochilus hortensis*, *Atomaria pusilla*, *Cryptophagus acutangulus*, *C. dentatus*, *C. saginatus*, *Orthoperus corticalis*.

3.39. *Postia caesia* (Schrad.: Fr.) P. Karst. (26)

Larvae and imago reared: *Hallomenus binotatus*.

3.40. *Postia fragilis* (Fr.) Jülich (9)

Larvae and imago reared: *Hallomenus axillaris*, *H. binotatus* (last species is more common).

3.41. *Pycnoporellus fulgens* (Fr.) Donk (52)

Larvae and imago reared: *Ennearthron cornutum*, *Hallomenus axillaris*, *H. binotatus*. Larvae of *Atomaria affinis* develop both in basidiocarps and the brown rot of the fungus.

Imago only: *Grynocharis oblonga*, *Ostoma ferruginea*.

3.42. *Pycnoporus cinnabarinus* (Jacq.: Fr.) P. Karst. (49)

Larvae and imago reared: *Sulcaxis affinis*.

Imago only: *Hallomenus binotatus*.

3.43. *Rigidoporus corticola* (Fr.) Pouzar (29)

Imago only: *Acrulia inflata*, *Atheta pallidicornis*, *Lordithon lunulatus*, *Scaphidium quadrimaculatum*, *Scaphisoma agaricinum*, *S. boreale*.

3.44. *Rigidoporus latemarginatus* (Durieu & Mont.) Pouzar (17)

Imago only: *Scaphisoma assimile*, *S. boreale*.

3.45. *Rigidoporus ulmarius* (J. Sowerby: Fr.) Imazeki (30)

Imago only: *Gyrophæna fasciata*, *G. manca*, *Sepedophilus testaceus*.

3.46. *Spongipellis spumea* (J. Sowerby: Fr.) Pat. (23)

Larvae and imago reared: *Cis micans*.

3.47. *Trametes cervina* (Schwein.) Bres. (16)

Larvae and imago reared: *Dacne bipustulata*, *Cis boleti*, *C. hispidus*, *Sulcaxis bidentulus*.

3.48. *Trametes gibbosa* (Pers.) Fr. (92)

Fungi of the genus *Trametes* are mostly eaten by larvae of *Cis comptus*, *Cis rugulosus*, *Sulcaxis affinis*, *S. fronticornis*, *Octotemnus glabriculus* and some other Ciidae. *Trametes gibbosa* was for some time considered to belong to the monotypic genus *Pseudotrametes* (*P. gibbosa* (Pers.) Bondartsev & Singer). Present knowledge of the beetle communities in polypores supports this separation.

Larvae and imago reared: only *Sulcaxis fronticornis* was reared from basidiocarps collected in the research area.

Imago only: *Atheta pilicornis*, *Phloeonomus pusillus*.

3.49. *Trametes hirsuta* (Wulfen: Fr.) Pilát (198)

Larvae and imago reared: *Tritoma bipustulata*, *T. subbasalis*, *Cis boleti*, *C. comptus*, *C. fissicornis*, *C. hispidus*, *C. micans*, *Sulcaxis affinis*, *S. fronticornis*, *Wagaicis wagai*, *Orchesia fusiformis*.

Imago only: *Atheta britanniae*, *A. crassicornis*, *A. gogatina*, *Dacne bipustulata*.

**3.50. *Trametes ochracea* (Pers.)
Gilb. & Ryvarde (154)**

Larvae and imago reared: *Tritoma subbasalis*, *Cis boleti*, *C. comptus*, *C. fissicornis*, *C. hispidus*, *C. micans*, *Octotemnus glabriculus*, *Sulcacis affinis*, *S. fronticornis*, *Wagaicis wagai*, *Orchesia fusiformis*.

Imago only: *Dinaraea aequata*, *Bitoma crenata*.

**3.51. *Trametes pubescens* (Schumach.: Fr.)
Pilát (182) (including *T. velutina* (Fr.)
G. Cunn.)**

Larvae and imago reared: *Tritoma bipustulata*, *T. subbasalis*, *Cis boleti*, *C. comptus*, *C. fissicornis*, *C. hispidus*, *Octotemnus glabriculus*, *Sulcacis affinis*, *S. fronticornis*, *Wagaicis wagai*, *Orchesia fusiformis*.

Imago only: *Atheta crassicornis*, *Gyrophana affinis*, *Latridius hirtus*, *Ennearthron laricinum*, *Abdera affinis*, *A. flexuosa*.

3.52. *Trametes suaveolens* (L.: Fr.) Fr. (56)

Larvae and imago reared: *Cis boleti*, *C. fissicornis*, *C. hispidus*, *C. micans*.

3.53. *Trametes versicolor* (L.: Fr.) Pilát (202)

Larvae and imago reared: *Tritoma subbasalis*, *Cis boleti*, *C. comptus*, *C. fissicornis*, *C. hispidus*, *C. micans*, *Octotemnus glabriculus*, *Sulcacis affinis*, *S. fronticornis*, *Wagaicis wagai*, *Orchesia fusiformis*. Also *Cis glabratus* was reared from the basidiocarps of this species, but it is a rather rare, untypical substrate for this beetle.

Imago only: *Agaricochara latissima*, *Atheta fungi*, *Dinaraea aequata*, *Scaphisoma agaricinum*, *Dacne bipustulata*.

**3.54. *Trichaptum abietinum* (Dicks.: Fr.)
Ryvarden**

**3.55 *Trichaptum fuscoviolaceum* (Ehrenb.:
Fr.) Ryvarden (380)**

We could not find differences in the beetle fauna of these two *Trichaptum* species.

Larvae and imago reared: *Cis punctulatus*,

Wanachia triguttata, *Zilora elongata*.

**3.56. *Trichaptum pargamenum* (Fr. in
Klotzsch) G. Cunn. (181) (= *Trichaptum
biforme* (Fr. in Klotzsch) Ryvarden)**

Larvae and imago reared: *Cis comptus*, *C. jacquemartii*, *Ennearthron cornutum*, *Ropalodontus strandi*. Occasional rearings of *Cis punctulatus* were also conducted.

Imago only: *Epuraea variegata*, *Scaphisoma agaricinum*.

3.57. *Tyromyces chioneus* (Fr.) P. Karst. (73)

Larvae and imago reared: This fungus is the main food source for *Hallomenus axillaris* and *H. binotatus* larvae in the Moscow region.

Imago only: *Cryptophagus abietis*.

4. Discussion

There are three main relationship groups between beetles and polypores in Moscow region.

The first group consists of larvae of the truly mycetophagous species that develop inside or on the surface of polypore basidiocarps and feed on fungus mycelia or spores. This group includes species of Staphylinidae, Dorcatominae, Trogossitidae (*Thymalus*), Nitidulidae (*Epuraea contractula*, *E. distincta*, *E. variegata* and *E. silacea*), Erotylidae (*Tritoma* spp., *Dacne bipustulata* and *Triplax russica*), almost all Ciidae and Mycetophagidae species, and part of the species of Tetratomidae (*Hallomenus*), Melandryidae (*Orchesia micans*, *O. fusiformis*, all species of *Abdera* (subgenus *Caridua*), *Wanachia* and *Zilora* genera), Mordellidae (*Curtimorda*) and Tenebrionidae (*Bolitophagus*, *Eledona*, *Diaperis*, *Neomida* and *Pentaphyllus*).

Certain polyphagous larvae of Ciidae utilize the highest number of fungus substrates (*Ennearthron cornutum* develops in 20 species of polypores, *Cis comptus* uses 16 species), Erotylidae (*Dacne bipustulata* colonizes 10 polypore species) and Anobiidae (*Dorcatoma dresdensis* develops in eight polypore species).

Some species of the truly mycetophagous beetles are monophagous, developing only in a

certain polypore species. *Dorcatoma punctulata* (inhabiting *Fomitopsis pinicola*), *Epuraea distincta* (*Daedaleopsis confragosa*), *Triplax russica* (*Inonotus obliquus*), *Bolitophagus reticulatus* (*Fomes fomentarius*), *Eledona agaricola* and *Pentaphyllus testaceus* (*Laetiporus sulphureus*) are monophagous.

The larvae of oligophagous beetles feed inside the fruiting bodies of the polypores of a single genus: *Cis punctulatus*, *Wanachia triguttata*, *Zilora elongata* (*Trichaptum* spp. on conifers) and *Curtimorda* (*Gloeophyllum* spp.).

The most speciose group includes all the beetle species collected at the imaginal stage only. Some species can be found only on fruiting bodies covered by anamorphic fungi, or on polypores partly covered by myxomycete plasmodium. These beetle species probably use polypores as sources for food at their imaginal stages.

Mycetoxenous beetles occasionally visit basidiocarps of polypore fungi but do not usually eat fungal parts. Some of them are predators, like *Philonthus* spp., *Quedius* spp., clerid larvae of the genera *Tillus*, and *Korynetes* that feeds on Anobiidae larvae. Also, larvae of *Cercyon* spp., *Megasternum obscurum*, *Cryptopleurum* spp., *Gnathoncus buyssoni* sometimes feed on larvae and pupae of other insects. Examples of dung- and carrion-eating beetles found on polypore fruiting bodies are *Geotrupes stercorosus*, *Oiceoptoma thoracica* and *Nicrophorus vespilloides*.

One of the very specialized families of beetles that develop in polypores is Ciidae. The host preferences of these species are mostly determined by the hardness of the fruiting body, not by the close systematical relations of polypore genera. *Fomes*, *Fomitopsis*, *Ganoderma* and *Phellinus* polypores are colonized mostly by *Cis* species of the “*jacquemartii*” group (*C. lineatocribratus*, *C. alter*, *C. glabratus*, *C. jacquemartii*). The group “*micans*” (*C. hispidus*, *C. micans*, *C. boleti*), on the other hand, utilizes annual and softer polypores like *Trametes*, *Lenzites* and *Daedaleopsis*. *Cis punctulatus* develops in *Trichaptum* species on conifers. The only *Cis* species with a really wide trophic spectrum is *Cis comptus*.

Apart from *Cis comptus*, only *Ennearthron cornutum* (that prefers hard basidiocarps) and *Dacne bipustulata* (Erotylidae) have rather wide host-fungus range. The majority of the other

mycetophagous beetles shows some preferences for a systematical or structure-based group of substrates.

Sometimes the influence of host tree can be detected, like in the case of *Trichaptum*. Two species of *Trichaptum* grow on coniferous trees and have a uniform beetle fauna, but *Trichaptum pargamenum* (that grows on deciduous trees) is colonized by a different set of beetles that live also in *Trametes* and *Lenzites betulinus* polypores of deciduous trees.

According to our observations, the most diverse communities of polypore-inhabiting beetles can be found along forest margins with a mixture of different-aged coniferous and deciduous trees.

Several beetle species are spring active, while others, like such that often hibernate as larvae (e.g. *Dorcatoma*, *Hallomenus*, *Orchesia*, *Abdera* subgenus *Caridua*, *Wanachia* and *Curtimorda*) and emerge later, are usually active in midsummer. Most of the species are monovoltinuous, and some beetles that develop in hard, perennial fruiting bodies (*Dorcatoma* and *Bolitophagus*) may develop for more than one year.

A total of 261 beetle species connected with polypore fungi were found in the Moscow region. Of these, 174 species were found in polypores only as imagos, while 87 species develop in polypores at their larval stages. The actual species diversity of polypore inhabitants is probably higher. The highest species diversity was found in polypores of deciduous trees: *Fomes fomentarius* (102 species), *Polyporus squamosus* (94 species), *Laetiporus sulphureus* (81 species) and *Piptoporus betulinus* (62 species). In the Moscow region, mono- and oligophagous beetles developing in polypores were found in the genera *Dorcatoma*, *Epuraea*, *Triplax*, *Cis*, *Curtimorda*, *Abdera* (subgenus *Caridua*), *Wanachia*, *Eledona* and *Pentaphyllus*. *Ennearthron cornutum* (20 species of polypores) and *Cis comptus* (16 species) have the highest number of host fungi.

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Appendix. Systematic list of beetle species (linked to polypores either on imaginal only or both imaginal and larval stages). "Found" column: + = Larvae develop in polypore basidiocarp, using it as a source of food; +/- = Larvae were not found (or they do not use the polypore basidiocarp as food); - = only imagos were found. "Polypore nr." is an index, referring to the text, by polypore species number. It does not indicate directly the fungal host of a given beetle species.

Nr.	Family and species	Found	Polypore nr.
Leiodidae Fleming, 1821			
1	<i>Anisotoma humeralis</i> (Fabricius, 1792)	-	3.6; 3.7; 3.10; 3.11; 3.33
2	<i>Anisotoma axillaris</i> Gyllenhal, 1810	-	3.10
3	<i>Anisotoma castanea</i> (Herbst, 1792)	-	3.10; 3.11
4	<i>Anisotoma glabra</i> (Kugelann, 1794)	-	3.10
5	<i>Amphicyllis globus</i> (Fabricius, 1792)	-	3.10
6	<i>Agathidium rotundatum</i> (Gyllenhal, 1827)	-	3.10
7	<i>Agathidium confusum</i> Brisout de Barneville, 1863	-	3.10
8	<i>Agathidium seminulum</i> (Linnaeus, 1758)	-	3.27; 3.38
9	<i>Agathidium nigripenne</i> (Fabricius, 1792)	-	3.10; 3.33
10	<i>Agathidium laevigatum</i> Erichson, 1845	-	3.10
Silphidae Latreille, 1807			
11	<i>Nicrophorus vespilloides</i> Herbst, 1784	-	3.24
12	<i>Oiceoptoma thoracica</i> (Linnaeus, 1758)	-	3.24; 3.26
Cholevidae Kirby, 1837			
13	<i>Sciodrepoides watsoni</i> (Spence, 1815)	-	3.26
14	<i>Sciodrepoides fumatus</i> (Spence, 1815)	-	3.38
15	<i>Catops nigrita</i> Erichson, 1837	-	3.26
16	<i>Catops nigricans</i> (Spence, 1815)	-	3.26
Staphylinidae Latreille, 1802			
17	<i>Philonthus fimetarius</i> (Gravenhorst, 1802)	-	3.33; 3.38
18	<i>Philonthus succicola</i> Thomson, 1860	-	3.24; 3.26; 3.33; 3.38
19	<i>Philonthus subuliformis</i> (Gravenhorst, 1802)	-	3.38
20	<i>Philonthus carbonarius</i> (Gravenhorst, 1802)	-	3.26; 3.33; 3.38
21	<i>Velleius dilatatus</i> (Fabricius, 1787)	-	3.9
22	<i>Quedius cruentus</i> (Olivier, 1795)	-	3.26; 3.38
23	<i>Quedius brevicornis</i> Thomson, 1860	-	3.26
24	<i>Oxyporus rufus</i> (Linnaeus, 1758)	-	3.38
25	<i>Megarthrus depressus</i> (Paykull, 1789)	-	3.26; 3.38
26	<i>Megarthrus sinuatocollis</i> (Lacordaire, 1835)	-	3.38
27	<i>Megarthrus hemipterus</i> (Illiger, 1794)	-	3.9; 3.24; 3.26
28	<i>Megarthrus denticollis</i> (Beck, 1817)	-	3.38
29	<i>Megarthrus nitidulus</i> Kraatz, 1858	-	3.26; 3.38
30	<i>Proteinus brachypterus</i> (Fabricius, 1792)	-	3.2; 3.33; 3.38
31	<i>Proteinus atomarius</i> Erichson, 1840	-	3.9; 3.26; 3.33; 3.38
32	<i>Proteinus ovalis</i> Stephens, 1834	-	3.38
33	<i>Proteinus macropterus</i> (Gravenhorst, 1806)	-	3.26
34	<i>Omalius rivulare</i> (Paykull, 1789)	-	3.26; 3.38
35	<i>Acrulia inflata</i> (Gyllenhal, 1813)	-	3.2; 3.10; 3.20; 3.43
36	<i>Phloeonomus pusillus</i> (Gravenhorst, 1806)	-	3.26; 3.38; 3.48
37	<i>Caryoscapa limbatum</i> (Erichson, 1845)	-	3.10
38	<i>Scaphidium quadrimaculatum</i> Olivier, 1790	-	3.2; 3.3; 3.10; 3.26; 3.43
39	<i>Scaphisoma agaricinum</i> (Linnaeus, 1758)	-	3.2; 3.3; 3.5; 3.10; 3.11; 3.13; 3.21; 3.24; 3.29; 3.33; 3.43; 3.53; 3.56
40	<i>Scaphisoma inopinatum</i> Löbl, 1967	-	3.11
41	<i>Scaphisoma boleti</i> (Panzer, 1793)	-	3.2; 3.11; 3.33
42	<i>Scaphisoma subalpinum</i> Reitter, 1881	-	3.2; 3.5; 3.10; 3.11; 3.13; 3.21; 3.38
43	<i>Scaphisoma balcanicum</i> Tamanini, 1954	-	3.5; 3.12; 3.32
44	<i>Scaphisoma boreale</i> Lundblad, 1952	-	3.10; 3.12; 3.13; 3.43, 3.44
45	<i>Scaphisoma assimile</i> Erichson, 1845	-	3.44
46	<i>Anotylus nitidulus</i> (Gravenhorst, 1802)	-	3.26; 3.38

47	<i>Phloeocharis subtilissima</i> Mannerheim, 1830	–	3.5; 3.33
48	<i>Carpachis striatus</i> (Olivier, 1794)	–	3.24
49	<i>Lordithon thoracicus</i> (Fabricius, 1777)	–	3.13; 3.29; 3.38
50	<i>Lordithon exoletus</i> (Erichson, 1839)	–	3.24; 3.33
51	<i>Lordithon lunulatus</i> (Linnaeus, 1761)	–	3.24; 3.26; 3.33; 3.36; 3.38; 3.43
52	<i>Sepedophilus littoreus</i> (Linnaeus, 1758)	–	3.10; 3.38
53	<i>Sepedophilus testaceus</i> (Fabricius, 1792)	–	3.38; 3.45
54	<i>Sepedophilus marshami</i> (Stephens, 1832)	+	3.10
55	<i>Sepedophilus bipustulatus</i> (Gravenhorst, 1802)	+	3.10
56	<i>Sepedophilus pedicularius</i> (Gravenhorst, 1802)	+	3.10
57	<i>Aleochara moerens</i> Gyllenhal, 1827	–	3.13
58	<i>Aleochara sanguinea</i> (Linnaeus, 1758)	–	3.26
59	<i>Oxypoda alternans</i> (Gravenhorst, 1802)	–	3.26; 3.33
60	<i>Haploglossa villosula</i> (Stephens, 1832)	–	3.10
61	<i>Pentanota meusei</i> Bernhauer, 1905	–	3.24
62	<i>Atheta (Microdota) subtilis</i> (Scriba, 1866)	–	3.13; 3.26; 3.38
63	<i>Atheta (Microdota) pittionii</i> Scheerpeltz, 1950	–	3.10; 3.13; 3.26; 3.38
64	<i>Atheta (Datomicra) celata</i> (Erichson, 1837)	–	3.26; 3.38
65	<i>Atheta (Datomicra) nigra</i> (Kraatz, 1856)	–	3.38
66	<i>Atheta (Datomicra) dadopora</i> Thomson, 1867	–	3.26
67	<i>Atheta (Mocyta) fungi</i> (Gravenhorst, 1806)	–	3.2; 3.10; 3.13; 3.26; 3.33; 3.38; 3.53
68	<i>Atheta (Mycetota) laticollis</i> (Stephens, 1832)	–	3.26; 3.38
69	<i>Atheta (Plataraea) nigrifula</i> (Gravenhorst, 1802)	–	3.26; 3.33
70	<i>Atheta</i> (s. str.) <i>liturata</i> (Stephens, 1832)	–	3.23; 3.26; 3.38
71	<i>Atheta</i> (s. str.) <i>oblita</i> (Erichson, 1839)	–	3.22; 3.26; 3.38
72	<i>Atheta</i> (s. str.) <i>boletophila</i> (Thomson, 1856)	–	3.10; 3.24
73	<i>Atheta</i> (s. str.) <i>diversa</i> (Sharp, 1869)	–	3.13
74	<i>Atheta</i> (s. str.) <i>pilicornis</i> (Thomson, 1852)	–	3.13; 3.26; 3.48
75	<i>Atheta</i> (s. str.) <i>fungicola</i> (Thomson, 1852)	–	3.33; 3.38
76	<i>Atheta</i> (s. str.) <i>britanniae</i> Bernhauer et Scheerpeltz, 1926	–	3.2; 3.26; 3.27; 3.33; 3.38; 3.49
77	<i>Atheta</i> (s. str.) <i>castanoptera</i> (Mannerheim, 1831)	–	3.24; 3.26; 3.33; 3.38
78	<i>Atheta</i> (s. str.) <i>euryptera</i> (Stephens, 1832)	–	3.13; 3.38
79	<i>Atheta</i> (s. str.) <i>crassicornis</i> (Fabricius, 1792)	–	3.2; 3.13; 3.26; 3.33; 3.38; 3.49; 3.51
80	<i>Atheta</i> (s. str.) <i>paracrassicornis</i> Brundin, 1954	–	3.10; 3.13; 3.26; 3.38
81	<i>Atheta</i> (s. str.) <i>nigricornis</i> (Thomson, 1852)	–	3.10; 3.26; 3.33; 3.38
82	<i>Atheta</i> (s. str.) <i>harwoodi</i> Williams, 1930	–	3.26; 3.33
83	<i>Atheta</i> (s. str.) <i>ravilla</i> (Erichson, 1839)	–	3.26
84	<i>Atheta (Alaobia) sodalis</i> (Erichson, 1837)	–	3.10; 3.13; 3.26; 3.33; 3.38
85	<i>Atheta (Alaobia) gagatina</i> (Baudi, 1848)	–	3.26; 3.33; 3.38; 3.49
86	<i>Atheta (Alaobia) pallidicornis</i> (Thomson, 1856)	–	3.2; 3.5; 3.10; 3.13; 3.33; 3.38; 3.42
87	<i>Atheta (Dimetrota) aeneipennis</i> (Thomson, 1856)	–	3.13
88	<i>Atheta (Traumoecia) picipes</i> (Thomson, 1856)	–	3.10; 3.33; 3.38
89	<i>Anopleta corvina</i> (Thomson, 1856)	–	3.38
90	<i>Dinaraea aequata</i> (Erichson, 1837)	–	3.2; 3.10; 3.11; 3.12; 3.13; 3.25; 3.33; 3.36; 3.38; 3.50; 3.53
91	<i>Dinaraea linearis</i> (Gravenhorst, 1802)	–	3.13
92	<i>Dinaraea angustula</i> (Gyllenhal, 1810)	–	3.33; 3.36
93	<i>Gyrophaena pulchella</i> Heer, 1839	–	3.26
94	<i>Gyrophaena affinis</i> Mannerheim, 1830	–	3.10; 3.26; 3.29; 3.33; 3.36; 3.38; 3.51
95	<i>Gyrophaena nana</i> (Paykull, 1800)	–	3.10; 3.29; 3.38
96	<i>Gyrophaena gentilis</i> Erichson, 1839	–	3.38
97	<i>Gyrophaena poweri</i> Crotch, 1866	–	3.38
98	<i>Gyrophaena minima</i> Erichson, 1837	–	3.38
99	<i>Gyrophaena fasciata</i> (Marsham, 1802)	–	3.10; 3.13; 3.26; 3.29; 3.38; 3.45
100	<i>Gyrophaena orientalis</i> Strand, 1938	–	3.26;
101	<i>Gyrophaena bihamata</i> Thomson, 1867	–	3.29; 3.38
102	<i>Gyrophaena joyi</i> Wendeler, 1924	–	3.38
103	<i>Gyrophaena joyioides</i> Wusthoff, 1937	–	3.29; 3.38
104	<i>Gyrophaena manca</i> Erichson, 1839	–	3.10; 3.12; 3.26; 3.29; 3.38; 3.45

105	<i>Gyrophæna strictula</i> Erichson, 1839	–	3.5; 3.6; 3.7; 3.10; 3.29; 3.38
106	<i>Gyrophæna boleti</i> (Linnaeus, 1758)	–	3.11
107	<i>Gyrophæna transversalis</i> Strand, 1939	–	3.38
108	<i>Gyrophæna obsoleta</i> Ganglbauer, 1895	–	3.38
109	<i>Gyrophæna lucidula</i> Erichson, 1837	–	3.38
110	<i>Agaricochara latissima</i> (Stephens, 1832)	–	3.6; 3.7; 3.33; 3.53
111	<i>Bolitochara obliqua</i> Erichson, 1837	–	3.5; 3.10; 3.11; 3.29; 3.33; 3.38
112	<i>Bolitochara mulsanti</i> Sharp, 1875	–	3.10; 3.11; 3.13; 3.33
113	<i>Bolitochara pulchra</i> (Gravenhorst, 1806)	–	3.5; 3.10; 3.26
114	<i>Bolitochara lucida</i> (Gravenhorst, 1802)	–	3.26; 3.38
115	<i>Phymatura brevicollis</i> (Kraatz, 1856)	–	3.10; 3.11
116	<i>Leptusa pulchella</i> (Mannerheim, 1830)	–	3.10
117	<i>Euryusa castanoptera</i> Kraatz, 1856	–	3.10
118	<i>Homalota plana</i> (Gyllenhal, 1810)	–	3.33
119	<i>Cyphea curtula</i> (Erichson, 1837)	–	3.10
120	<i>Placusa tachyporoides</i> (Waltl, 1838)	–	3.10; 3.11
121	<i>Autalia longicornis</i> Scheerpeltz, 1947	–	3.26
122	<i>Oligota granaria</i> Erichson, 1837	–	3.6; 3.7
Hydrophilidae Latreille, 1802			
123	<i>Cercyon lateralis</i> (Marsham, 1802)	–	3.26; 3.33; 3.38
124	<i>Cercyon impressus</i> (Sturm, 1807)	–	3.26; 3.38
125	<i>Megasternum obscurum</i> (Marsham, 1802)	–	3.26; 3.33; 3.38
126	<i>Cryptopleurum minutum</i> (Fabricius, 1775)	–	3.26; 3.38
Histeridae Gyllenhal, 1808			
127	<i>Gnathoncus buyssoni</i> Auzat, 1917	–	3.26
Ptiliidae Heer, 1843			
128	<i>Nossidium pilosellum</i> (Marsham, 1802)	–	3.38
Scarabaeidae Latreille, 1802			
129	<i>Geotrupes stercorosus</i> (Scriba, 1791)	–	3.26; 3.24
Scirtidae Fleming, 1821			
130	<i>Cyphon pubescens</i> (Fabricius, 1792)	–	3.10
Elateridae Leach, 1815			
131	<i>Denticollis linearis</i> (Linnaeus, 1758)	+/-	3.29
Dermestidae Latreille, 1804			
132	<i>Globicornis emarginata</i> (Gyllenhal, 1808)	+/-	3.24
Anobiidae Fleming, 1821			
133	<i>Dorcatoma flavicornis</i> (Fabricius, 1792)	+/-	3.26
134	<i>Dorcatoma substriata</i> Hummel, 1829	+	3.24; 3.25
135	<i>Dorcatoma punctulata</i> Mulsant et Rey, 1864	+	3.11
136	<i>Dorcatoma dresdensis</i> Herbst, 1792	+	3.10; 3.13; 3.21; 3.23; 3.24; 3.25; 3.29; 3.32
137	<i>Dorcatoma robusta</i> Strand, 1938	+	3.10
138	<i>Dorcatoma lomnickii</i> Reitter, 1903	+	3.10; 3.13; 3.29
139	<i>Dorcatoma chrysomelina</i> Sturm, 1837	+/-	3.26
Trogossitidae Latreille, 1802			
140	<i>Peltis grossa</i> (Linnaeus, 1758)	+/-	3.10; 3.11
141	<i>Ostoma ferruginea</i> (Linnaeus, 1758)	+/-	3.11; 3.41
142	<i>Thymalus oblongus</i> Reitter, 1889	+	3.2; 3.3; 3.5; 3.6; 3.7; 3.11; 3.29; 3.33
143	<i>Grynocharis oblonga</i> (Linnaeus, 1758)	–	3.11; 3.41
Cleridae Latreille, 1802			
144	<i>Tillus elongatus</i> (Linnaeus, 1758)	+/-	3.29
145	<i>Korynetes caeruleus</i> (De Geer, 1775)	+/-	3.29
Nitidulidae Latreille, 1802			
146	<i>Eपुरaea distincta</i> (Grimmer, 1841)	+	3.6; 3.7
147	<i>Eपुरaea biguttata</i> (Thunberg, 1784)	+	3.10
148	<i>Eपुरaea variegata</i> (Herbst, 1793)	+	3.1; 3.3; 3.10; 3.11; 3.13; 3.33; 3.56
149	<i>Eपुरaea silacea</i> (Herbst, 1784)	+	3.10; 3.24; 3.33; 3.38
150	<i>Eपुरaea contractula</i> J. Sahlberg, 1889	+	3.9; 3.10
151	<i>Eपुरaea concurrens</i> Sjöberg, 1939	–	3.10; 3.11
152	<i>Eपुरaea limbata</i> (Fabricius, 1787)	–	3.10; 3.38
153	<i>Eपुरaea unicolor</i> (Olivier, 1790)	–	3.10

154	<i>Pocadius ferrugineus</i> (Fabricius, 1775)	–	3.10; 3.11; 3.26; 3.38
155	<i>Cyllodes ater</i> (Herbst, 1792)	–	3.8; 3.10; 3.11; 3.24; 3.33
156	<i>Glischrochilus grandis</i> (Tournier, 1785) (= <i>Glischrochilus grandis</i> (Reitter, 1883))	–	3.10
157	<i>Glischrochilus hortensis</i> (Geoffroy, 1785)	–	3.10; 3.38
Monotomidae Laporte de Castelnau, 1840			
158	<i>Rhizophagus bipustulatus</i> (Fabricius, 1792)	–	3.10
159	<i>Rhizophagus dispar</i> (Paykull, 1800)	–	3.10
160	<i>Rhizophagus parvulus</i> (Paykull, 1800)	–	3.10
Sphindidae Jacquelin du Val, 1860			
161	<i>Aspidiphorus orbiculatus</i> (Gyllenhal, 1808)	–	3.10
Cryptophagidae Kirby, 1837			
162	<i>Pteryngium crenatum</i> (Fabricius, 1798)	–	3.11; 3.38
163	<i>Cryptophagus abietis</i> (Paykull, 1798)	–	3.9; 3.57
164	<i>Cryptophagus acutangulus</i> Gyllenhal, 1827	–	3.38
165	<i>Cryptophagus badius</i> Sturm, 1845	–	3.4
166	<i>Cryptophagus saginatus</i> Sturm, 1845	–	3.38
167	<i>Cryptophagus dentatus</i> (Herbst, 1793)	–	3.23; 3.25; 3.26; 3.33; 3.38
168	<i>Cryptophagus pseudodentatus</i> Bruce, 1934	–	3.29
169	<i>Cryptophagus pubescens</i> Sturm, 1845	–	3.9
170	<i>Cryptophagus scanicus</i> (Linnaeus, 1758)	–	3.26; 3.38
171	<i>Cryptophagus pallidus</i> Sturm, 1845	–	3.33
172	<i>Cryptophagus setulosus</i> Sturm, 1845	–	3.10; 3.26; 3.38
173	<i>Caenoscelis ferruginea</i> (Sahlberg, 1820)	–	3.33
174	<i>Atomaria pusilla</i> (Paykull, 1798)	–	3.38
175	<i>Atomaria fuscata</i> (Schönherr, 1808)	–	3.33
176	<i>Atomaria apicalis</i> Erichson, 1846	–	3.13; 3.26; 3.38
177	<i>Atomaria alpina</i> Heer, 1841	–	3.10; 3.11; 3.29
178	<i>Atomaria affinis</i> (F. Sahlberg, 1834)	+	3.41
Erotylidae Latreille, 1802			
179	<i>Tritoma bipustulata</i> Fabricius, 1775	+	3.12; 3.35; 3.49; 3.51
180	<i>Tritoma subbasalis</i> (Reitter, 1896)	+	3.6; 3.7; 3.21; 3.27; 3.34; 3.49; 3.50; 3.51; 3.53
181	<i>Triplax russica</i> (Linnaeus, 1758)	+	3.10; 3.24; 3.26; 3.38
182	<i>Dacne bipustulata</i> (Thunberg, 1781)	+	3.2; 3.6; 3.7; 3.9; 3.12; 3.23; 3.25; 3.26; 3.33; 3.38; 3.47; 3.49; 3.53
Cerylonidae Billberg, 1820			
183	<i>Cerylon fagi</i> Brisout de Barneville, 1867	–	3.13; 3.21; 3.38
184	<i>Cerylon histeroides</i> (Fabricius, 1792)	–	3.6; 3.7; 3.10; 3.27
185	<i>Cerylon ferrugineum</i> Stephens, 1830	–	3.3; 3.10; 3.13
186	<i>Cerylon deplanatum</i> Gyllenhal, 1827	–	3.2; 3.10; 3.27
Endomychidae Leach, 1815			
187	<i>Leiestes seminigra</i> (Gyllenhal, 1808)	+/-	3.10; 3.33
Corylophidae LeConte, 1852			
188	<i>Sericoderus lateralis</i> (Gyllenhal, 1827)	–	3.38
189	<i>Orthoperus rogeri</i> Kraatz, 1874 (= <i>Orthoperus punctulatus</i> Reitter, 1876)	–	3.2
190	<i>Orthoperus atomus</i> (Gyllenhal, 1808)	–	3.26
191	<i>Orthoperus corticalis</i> (Redtenbacher, 1849) (= <i>Orthoperus improvisus</i> Bruce, 1946)	–	3.4; 3.10; 3.26; 3.38
Latridiidae Erichson, 1842			
192	<i>Latridius hirtus</i> Gyllenhal, 1827	–	3.10; 3.27; 3.51
193	<i>Latridius consimilis</i> Mannerheim, 1844	–	3.10; 3.27; 3.33
194	<i>Latridius minutus</i> (Linnaeus, 1767)	–	3.4; 3.10
195	<i>Latridius brevicollis</i> (Thomson, 1868)	–	3.10
196	<i>Enicmus fungicola</i> Thomson, 1868	–	3.10
197	<i>Enicmus rugosus</i> (Herbst, 1793)	–	3.10
198	<i>Dienerella filum</i> (Aubé, 1850)	–	3.6; 3.7; 3.10
199	<i>Corticaria impressa</i> (Olivier, 1790)	–	3.10
200	<i>Corticaria lapponica</i> (Zetterstedt, 1838)	–	3.10

201	<i>Corticaria serrata</i> (Paykull, 1798)	–	3.27
202	<i>Corticaria rubripes</i> Mannerheim, 1844	–	3.10
203	<i>Corticaria alleni</i> Johnson, 1974	–	3.26
204	<i>Corticaria longicollis</i> (Zetterstedt, 1838)	–	3.4; 3.23
205	<i>Corticaria elongata</i> (Gyllenhal, 1827)	–	3.10
206	<i>Corticicara gibbosa</i> (Herbst, 1793)	–	3.10
Ciidae Leach, 1819			
207	<i>Cis lineatocribratus</i> Mellié, 1848	+	3.10; 3.19; 3.29; 3.33
208	<i>Cis alter</i> Silfverberg 1991 (= <i>Cis nitidus</i> auct. nec (Fabricius 1792))	+	3.10; 3.11; 3.13; 3.26
209	<i>Cis glabratus</i> Mellié, 1848	+	3.10; 3.11; 3.25; 3.31; 3.33; 3.53
210	<i>Cis jacquemartii</i> Mellié, 1848	+	3.10; 3.11; 3.13; 3.28; 3.29; 3.32; 3.33; 3.56
211	<i>Cis comptus</i> Gyllenhal, 1827	+	3.2; 3.3; 3.4; 3.6; 3.7; 3.12; 3.13; 3.20; 3.27; 3.48; 3.49; 3.50; 3.51; 3.52; 3.56
212	<i>Cis hispidus</i> (Paykull, 1798)	+	3.3; 3.23; 3.27; 3.47; 3.49; 3.50; 3.51; 3.52; 3.53
213	<i>Cis micans</i> (Fabricius, 1792)	+	3.3; 3.27; 3.46; 3.49; 3.50; 3.52; 3.53
214	<i>Cis boleti</i> (Scopoli, 1763)	+	3.6; 3.7; 3.27; 3.47; 3.49; 3.50; 3.51; 3.52; 3.53
215	<i>Cis rugulosus</i> Mellié, 1848	+	3.27; 3.48
216	<i>Cis punctulatus</i> Gyllenhal, 1827	+	3.54; 3.55; 3.56
217	<i>Cis fissicornis</i> Mellié, 1848	+	3.27; 3.49; 3.50; 3.51; 3.52; 3.53
218	<i>Cis bidentatus</i> (Olivier, 1790)	+	3.26
219	<i>Ennearthron cornutum</i> (Gyllenhal, 1827)	+	3.4; 3.6; 3.7; 3.8; 3.10; 3.11; 3.12; 3.13; 3.21; 3.23; 3.24; 3.25; 3.26; 3.28; 3.29; 3.31; 3.32; 3.33; 3.41; 3.56
220	<i>Ennearthron laricinum</i> (Mellié, 1848)	+	3.4; 3.11; 3.12; 3.26; 3.33; 3.51
221	<i>Ennearthron palmi</i> Lohse, 1966	+/-	3.26
222	<i>Sulcacis bidentulus</i> (Rosenhauer, 1847)	+	3.12; 3.37; 3.47
223	<i>Sulcacis affinis</i> (Gyllenhal, 1827)	+	3.2; 3.3; 3.12; 3.18; 3.27; 3.33; 3.42; 3.48; 3.49; 3.50; 3.51; 3.53
224	<i>Sulcacis fronticornis</i> (Panzer, 1809)	+	3.2; 3.3; 3.6; 3.7; 3.25; 3.26; 3.28; 3.48; 3.49; 3.50; 3.51; 3.53
225	<i>Wagaicis wagai</i> (Wankowicz, 1869)	+	3.27; 3.49; 3.50; 3.51; 3.53
226	<i>Ropalodontus strandi</i> (Lohse, 1969) *	+	3.10; 3.56
227	<i>Octotemnus glabriculus</i> (Gyllenhal, 1827)	+	3.12; 3.27; 3.48; 3.50; 3.51; 3.53
Colydiidae Erichson, 1842			
228	<i>Bitoma crenata</i> (Fabricius, 1775)	–	3.10; 3.50
Mycetophagidae Leach, 1815			
229	<i>Triphyllus bicolor</i> (Fabricius, 1777)	+	3.9; 3.33
230	<i>Litargus connexus</i> (Geoffroy, 1785)	+	3.6; 3.7; 3.10; 3.33; 3.38
231	<i>Mycetophagus quadripustulatus</i> (Linnaeus, 1761)	+	3.2; 3.24; 3.26; 3.33; 3.38
232	<i>Mycetophagus piceus</i> (Fabricius, 1777)	+	3.2; 3.6; 3.7; 3.10; 3.13; 3.21; 3.23; 3.24; 3.25; 3.26; 3.33; 3.38
233	<i>Mycetophagus ater</i> (Reitter, 1879)	+	3.2; 3.6; 3.7; 3.10; 3.11; 3.24; 3.26; 3.33; 3.38
234	<i>Mycetophagus decempunctatus</i> Fabricius, 1801	+	3.10; 3.13; 3.24; 3.25; 3.26; 3.33; 3.38
235	<i>Mycetophagus multipunctatus</i> Fabricius, 1792	+	3.4; 3.25; 3.26; 3.33; 3.38
236	<i>Mycetophagus quadriguttatus</i> Müller, 1821	–	3.26
Tetratomidae Billberg, 1820			
237	<i>Tetratoma ancora</i> Fabricius, 1790	–	3.2; 3.10; 3.32; 3.33
238	<i>Hallomenus axillaris</i> (Illiger, 1807)	+	3.18; 3.26; 3.38; 3.40; 3.41; 3.57
239	<i>Hallomenus binotatus</i> (Quensel, 1790)	+	3.18; 3.26; 3.39; 3.40; 3.41; 3.42; 3.57
Melandryidae Leach, 1815			
240	<i>Orchesia micans</i> (Panzer, 1794)	+	3.10; 3.21; 3.23; 3.24; 3.25; 3.27; 3.29
241	<i>Orchesia fasciata</i> (Illiger, 1798)	+/-	3.18; 3.26
242	<i>Orchesia fusiformis</i> Solsky, 1871	+	3.25; 3.27; 3.49; 3.50; 3.51; 3.53
243	<i>Abdera affinis</i> (Paykull, 1799)	+	3.24; 3.25; 3.29; 3.51; 3.53
244	<i>Abdera flexuosa</i> (Paykull, 1799)	+	3.25; 3.51
245	<i>Wanachia triguttata</i> (Gyllenhal, 1810)	+	3.54; 3.55

246	<i>Zilora elongata</i> J. Sahlberg, 1881	+	3.54; 3.55
247	<i>Melandrya dubia</i> (Schaller, 1783)	+/-	3.10; 3.29
248	<i>Phryganophilus auritus</i> Motschulsky, 1845	+/-	3.20
Anaspidae Mulsant, 1856			
249	<i>Anaspis marginicollis</i> Lindberg, 1925	+	3.23
250	<i>Anaspis arctica</i> Zetterstedt, 1828	+	3.32
Mordellidae Latreille, 1802			
251	<i>Tomoxia bucephala</i> Costa, 1854	+/-	3.10; 3.29
252	<i>Variimorda villosa</i> (Schrank, 1781)	+/-	3.10
253	<i>Curtimorda maculosa</i> (Naezen, 1794)	+	3.14; 3.15; 3.16
254	<i>Curtimorda bisignata</i> (Redtenbacher, 1849)	+	3.14; 3.15; 3.16; 3.17
Tenebrionidae Latreille, 1802			
255	<i>Bolitophagus reticulatus</i> (Linnaeus, 1767)	+	3.10; 3.29
256	<i>Eledona agaricola</i> (Herbst, 1783)	+	3.26
257	<i>Diaperis boleti</i> (Linnaeus, 1758)	+	3.4; 3.11; 3.26; 3.33; 3.28
258	<i>Neomida haemorrhoidalis</i> (Fabricius, 1787)	+	3.10; 3.13
259	<i>Scaphidema metallicum</i> (Fabricius, 1792)	-	3.3
260	<i>Pentaphyllus testaceus</i> (Hellwig, 1792)	+	3.26; 3.38
261	<i>Upis ceramboides</i> (Linnaeus, 1758)	+/-	3.10; 3.33

*) For the European Russia, *R. perforatus* (Gyllenhal, 1813) has previously been reported instead of the rather recently described *R. strandi*. Our studies show that the *Ropalodontus* species distributed in the north- and middle-European Russia (including Moscow region), and also in Siberia and Russian Far East, is *R. strandi* Lohse, 1969. Of two syntypes of *Cis perforatus* Gyllenhal, 1813 (= *Ropalodontus perforatus* (Gyllenhal, 1813)) 1 male Nr. 1281b was selected as a lectotype. We studied also *Ropalodontus strandi* Lohse, 1969 male paratype labelled "Nordreisa Bilito, Strand". The comparison of *Ropalodontus* specimens collected in Moscow region and other regions of European Russia and Siberia with types revealed their identity with the type of *Ropalodontus strandi* Lohse, 1969 and differences from *R. perforatus*. The last species is recorded for the territory of former USSR only for Carpathian Mountains.