



## Malacological news from the Czech and Slovak Republics in 2021

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This paper presents important faunistic records conducted in the Czech and Slovak Republics during 2021. In the Šumava Mts, South Bohemia, a hydrobiid snail of the genus *Alzoniella* was found. *Monacha cantiana* s. lato was genetically confirmed for the first time in the city of Bratislava, Slovakia. New sites of *Cornu aspersum* (Prague) and *Tandonia kusceri* (southern and central Slovakia) were confirmed. A new colony of the slug *Limacus maculatus* was found in SE Moravia. New records of several endangered species, e.g. *Vertigo angustior*, *V. moulinsiana*, *Anisus septemgyratus*, *Gyraulus acronicus*, *G. rossmaessleri*, *Planorbis carinatus*, *Pisidium amnicum*, *P. globulare*, *P. moitessierianum*, *P. pseudosphaerium* and *P. tenuilineatum*, are also presented. Location data are published with all details in a supplementary table.

**Key words:** mollusc fauna, faunistic survey, species list

### Introduction

Since the last comprehensive monograph on molluscs of the Czech and Slovak Republics has been published in 2013 (HORSÁK et al. 2013), we decided to publish malacological news from the territory of former Czechoslovakia annually in order to keep track of new important records. All these new data are used to regularly update an annotated checklist of molluscs and distribution maps of selected species (HORSÁK et al. 2022). The previous summary of new records covers the years 2015–2019 (ČEJKA et al. 2020) and 2020 (ČEJKA et al. 2021). In this

paper, we present important faunistic records conducted in the Czech and Slovak Republics during 2021. The rules for selecting records are: (i) the first record in Bohemia, Moravia or Slovakia, (ii) a regionally important new record, (iii) records of species listed in NATURA 2000 and the national Red Lists as critically endangered or endangered species, or (iv) non-native species currently spreading in new areas. In a few exceptions, we also included data older than 2021 if they met the above rules and were not published in ČEJKA et al. (2021). See Table 1 at the end of the article for detailed occurrence data for each species listed in the text.

## Comments on individual species (genera)

### *Alzoniella* sp.

A single fresh empty shell, which clearly resembles the genus *Alzoniella* because of its size (height < 1 mm) and shape (Fig. 1), was found in South Bohemia in the Šumava Mts, near the town of Volary. From the conchology, it looks identical to *A. slovenica* (Ložek & Brtek, 1964), a subterranean microsnail endemic to the west part of the Western Carpathians (HORSÁK et al. 2013, 2022). The shell has fine spiral lines that are not present in *A. slovenica*, which instead has fine and regular growth lines. Since the shells of many subterranean snails lack diagnostic characters, identification needs to be confirmed by molecular analysis. This is even more important in this case, as the occurrence of *A. slovenica* in Šumava Mts would be very surprising, both geographically and ecologically. Further studies are needed to obtain data on the distribution and habitats occupied in the Šumava Mts since the shell was found during a hydrobiological survey in the alluvial pools of the river Vltava and was only accidentally sorted out in the field from a sample taken in one of the sampled pools (Fig. 2). Since the pools are saturated with hyporheic water and the shell of this species is very fragile, it is very unlikely that the shell was washed away from a distant source.

### *Anisus septemgyratus* (Rossmässler, 1835)

A rare freshwater snail that inhabits larger and non-temporary pools. It is rare, especially in the lowlands of the



**Fig. 1.** The recorded shell of *Alzoniella* sp. from the Šumava Mts (S Bohemia). Photo by M. Horsák.



**Fig. 2.** The pool where the shell of *Alzoniella* sp. was found represents a very unusual type of habitat for collecting this subterranean snail. Photo by J. Bojková.

eastern part of the Slovak Republic (Východoslovenská nížina). We have discovered a new isolated site of this species in the Teplý vrch reservoir in Rimavská kotlina (basin in south Slovakia).

#### ***Arion intermedius* Normand, 1852**

These two records in eastern Bohemia are from areas not previously occupied by this species, and their relationship to native mountain populations is questionable because of the recent invasion of this species (Fig. 3) (see ČEJKA et al. 2020 and 2021).

#### ***Cepaea nemoralis* (Linnaeus, 1758)**

The recent eastward spread of this species is also confirmed by a new record from central Moravia, in a private garden in the town of Drásov, NW of Brno (see also ČEJKA et al. 2021).

#### ***Cornu aspersum* (O. F. Müller, 1774)**

Three new sites of this species were found in the central part of the Czech Republic, two sites were also found in the western part of the Slovak Republic (in the city of Bratislava and the municipality of Diviacka Nová Ves, W Slovakia). See ČEJKA et al. (2020) for more information about the species.

#### ***Gyraulus acronicus* (A. Férussac, 1807)**

Rare snail with a scattered distribution in the Czech Republic and Slovakia. During a meeting of Czech and Slovak malacologists in 2021 (Malacodays 2021) new localities were discovered in South Bohemia.

#### ***Gyraulus rossmaessleri* (Schmidt, 1852)**

Rare snail inhabiting temporary pools and wetlands, scattered in the Czech Republic and the southwestern part of Slovakia. Two new sites were found in the known area of its occurrence (Silesia, South Moravia), while the finding in Lhota is the first record in South Bohemia.

#### ***Limacus flavus* (Linnaeus, 1758)**

Three new sites have been reported for this species, one in the southwestern part of the Slovak Republic (Fig. 4) and two in the Czech Republic, in the central and southeastern parts. See ČEJKA et al. (2020) for more information about the species. For the taxonomic status of *L. flavus* and *L. maculatus*, see ČEJKA et al. (2020).

#### ***Limacus maculatus* (Kaleniczenko, 1851)**

It was first reported from SE Moravia in 2019 (ČEJKA et al. 2020). The colony at this site was repeatedly confirmed, and in 2021 a new colony was discovered at a nearby site of the pond Mlýnský rybník. Due to its nocturnal activity, this colony was also discovered by an entomologist collecting insects in the light at night (Fig. 5).

#### ***Monacha cantiana* (Montagu, 1803) sensu lato**

Four individuals of the genus *Monacha* were collected in Slovakia in the locality Bratislava – Dúbravka, Polianky (Fig. 6). They were initially identified as *Monacha claustralis/cartusiana* based on shell morphology, but genetic analysis by DNA barcoding using the standard mitochondrial cytochrome *c* oxidase (COI) gene showed that in all four cases the species belonged to *Monacha cantiana* s. l. and clearly different from the *M. claustralis/cartusiana* clade. Following BLAST results, we included in phylogenetic analysis representatives of the clades CAN-1 to CAN-6, which constitute the species complex of *M. cantiana* (PIEŃKOWSKA et al. 2020 and references therein), and also sequences of *M. claustralis* and *M. cartusiana* from Čejka et al. (2020). Of the four individuals, three appeared in clade CAN-2, previously reported only from northern Italy, and one in the rather divergent clade CAN-3, previously found in northern Italy and Wien, Austria (Fig. 7). Without nuclear sequence data and considering the difficult and unsettled taxonomy of the species complex, we call our samples provisionally *M. cantiana* s. l. The phylogenetic results indicate poor correspondence between mi-



**Fig. 3.** *Arion intermedius* from the vicinity of the town of Třeboň, Czech Republic. Photo by R. Coufal.



Fig. 4. The cellar slug (*Limacus flavus*) from the town of Stupava (SW Slovakia). Photo by T. Čejka.



Fig. 5. *Limacus maculatus* from the newly discovered colony by Lednice (SE Moravia). Photo by M. Horsák.



Fig. 6. The shell of the snail *Monacha cantiana* s. l. from the city of Bratislava, Slovakia. Photo by T. Čejka.

tochondrial lineages and species in the *M. cantiana* complex. All sequences of *M. cantiana* SNMMo89-92 have been deposited in the BOLD database (accession numbers SNMMo89–SNMMo92) and GenBank (accession numbers OP100310–OP100313).

***Monacha cartusiana* (O. F. Müller, 1774)**

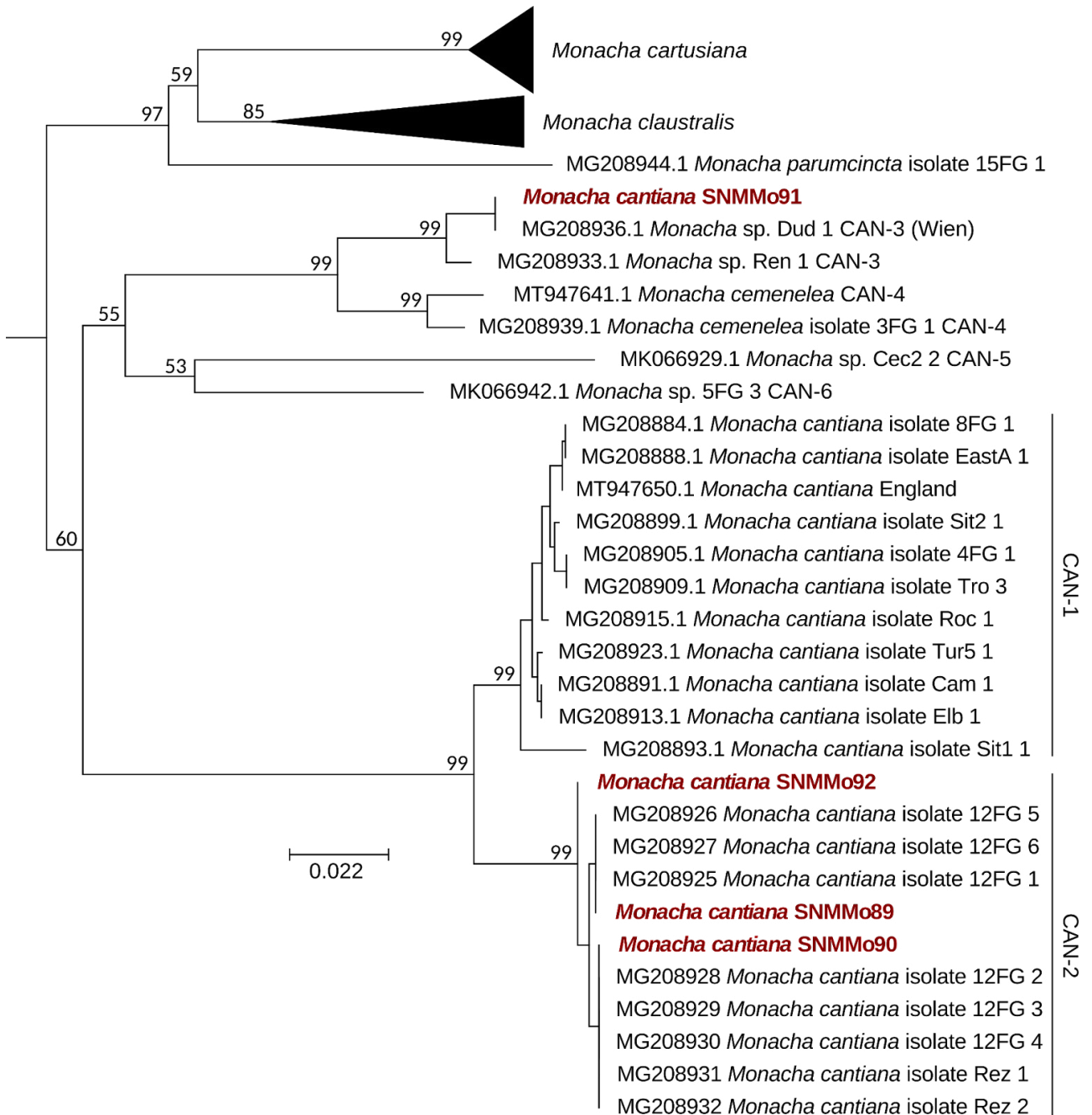
A mollusc that has appeared in recent years in ruderal and semi-natural habitats in the Czech Republic. The first new record is from a xerothermic site near the railroad line in the town of Strakonice. A new record compared to 2021 from this town. The second new record comes from grassland on a road embankment in Malý Újezd near Mělník.

***Pisidium amnicum* (O. F. Müller, 1774)**

In 2021, the abundant population of this pea mussel was found in the stream Řečice. This population is the only known recent population in the Vysočina region (BERAN 2022). See ČEJKA et al. (2021) for more information about the species.

***Pisidium globulare* Westerlund, 1873**

Some new sites with the occurrence of this rare and endangered species were found in the Czech Republic (Silesia, Southern Bohemia) and south Slovakia (near the village of Hrušovo, Revúcka vrchovina – upland in south Slovakia). See ČEJKA et al. (2020) for details about the species.



**Fig. 7.** The phylogenetic tree was reconstructed by the Maximum Likelihood method and Hasegawa-Kishino-Yano model (HASEGAWA et al. 1985) as the best-fitting model based on COI sequences and distances calculated with Kimura-2 parameter distances model (KIMURA 1980) in MEGA-X, with 1000 bootstrap replicates. Phylogenetic position of four samples of *Monacha cantiana* s. l. from Bratislava (in red). Clades CAN-1 and CAN-2 correspond to *M. cantiana* s. l.

***Pisidium moitessierianum* Paladilhe, 1866**

The occurrence of this rare and endangered species was in 2021 confirmed in the river Ohře. For more information about the species see ČEJKA et al. (2020).

***Pisidium pseudosphaerium* J. Favre, 1927**

The occurrence of this critically endangered species was in 2021 confirmed at several sites in Central Bohemia (Hrabanovská černava National Nature Monument) and Eastern Bohemia (Bohdanečský rybník National Nature Reserve). For more information about the species see ČEJKA et al. (2020).

***Pisidium tenuilineatum* Stelfox, 1918**

In 2021, this pea mussel was found in the stream Řečice (Fig. 8). This population is the only known recent population in the Vysočina region (BERAN 2022). See Čejka et al. (2020) for more information about the species. The known distribution in the Czech Republic is mentioned in Beran (2022) and in Slovakia in BERAN & ČEJKA (2019).

***Planorbis carinatus* O. F. Müller, 1774**

The occurrence of this rare species has been confirmed in the oxbow lakes of the river Vltava in Šumava and on the periphery of the Brdy Mts. See ČEJKA et al. (2020) for more information about the species.

***Potamopyrgus antipodarum* (Gray, 1843)**

In 2021, some new sites were discovered. Only the more remarkable records outside the known range are mentioned (fringes of the Brdy Mts, Beskydy Mts). See ČEJKA et al. (2020) for more information about the species.

***Pseudanodonta complanata* (Rossmässler, 1835)**

The persistent occurrence of this rare species has been confirmed in the rivers Odra, Labe, Dyje and Nežárka. See ČEJKA et al. (2020) for more information about the species.

***Radix ampla* (Hartmann, 1821)**

Only notable new finds outside the known range in the upper section of the river Svratka are mentioned.

***Radix lagotis* (Schrank, 1803)**

The occurrence of this species in the Czech Republic and Slovakia is still poorly known. The new finding comes from Eastern Bohemia. See ČEJKA et al. (2021) for more information about the species.

***Segmentina nitida* (O. F. Müller, 1774)**

This species lives mostly in vegetated pools and ponds at lower latitudes, especially in floodplains of rivers. Notable new records outside its known range in the Brdy Mts are mentioned (Fig. 9).



**Fig. 8.** The stream Řečice in the Vysočina region is inhabited by populations of *Pisidium tenuilineatum* and *P. amnicum*. Photo by L. Beran.

***Sinanodonta woodiana* (Lea, 1834)**

A non-native species that has been spreading rapidly lately. The new finding in the pond in the Brdy Mts is remarkable. See ČEJKA et al. (2020) for more information about the species.

***Sphaerium nucleus* (Studer, 1820)**

A species that lives mostly in vegetated stagnant waters at lower latitudes, and its distribution is not well known. Occurrence in many areas in the Czech Republic was confirmed in 2021. See ČEJKA et al. (2020) for more information about the species.

***Tandonia kusceri* (Wagner, 1931)**

Two new sites were recorded in the Slovak Republic (cemeteries in the towns of Dunajská Streda and Zvolen). See ČEJKA et al. (2020) for more information about the species.

***Theodoxus danubialis* (C. Pfeiffer, 1828)**

This species is very rare in the Czech Republic and its recent occurrence is known only from the lower section of the river Dyje, while in Slovakia it is more common in the Danube. The persistent occurrence of a rich population in the Dyje was confirmed in 2021.

***Unio crassus* Philipsson, 1788**

Some valuable records of this endangered species were documented in the Czech Republic in 2021. The occurrence of the extensive population of *U. crassus* was confirmed in the river Odra (Fig. 10) and a channel of the river Bečva in Hovězí. The surviving small population was confirmed in the stream Martinický potok. New sites with the occurrence of this bivalve were found in the Pardubice region (the stream Trotina) and in the Olomouc region (the river Morava in Olomouc). For more information about the species, see ČEJKA et al. (2020, 2021).

***Vertigo angustior* Jeffreys, 1830**

An isolated new population was found in southern Bohemia on the edge of the Lhota u Dynína (natural monument). Another new and isolated site of this species was found in the area of the town of Stupava in a small wetland in the floodplain of a stream (ČAČANÝ & ČEJKA 2020) (Fig. 11). See ČEJKA et al. (2020) for more information about the species.

***Vertigo moulinsiana* (Dupuy, 1849)**

This rare species, adapted to vegetation above flooded sites, seems to occur somewhat more frequently in the



**Fig. 9.** Ponds and wetlands in the Brdy Mts are inhabited by abundant populations of *Segmentina nitida*. The pond Dolejší padrtský rybník. Photo by V. Beranová.

lowland meadows of the Bílé Karpaty PLA, even in nature reserves and other well-known sites which has often been visited in the past. The identification in the field was confirmed especially by comparison with *Vertigo antivertigo* (Draparnaud, 1801), which also lives in the same lowland meadow. Two new records of *V. moulinsiana* in the Chmelinec Nature Reserve and in the Mechnáčky Nature Reserve in 2021 are based on routine biomonitoring of malacological assemblages. The record of this species in the Hrnčárky Nature Reserve reported from 2020 was also independently confirmed. There are several more places on the list to be visited during the current monitoring cycle, where this largest *Vertigo* could also be found. How does it conquer new places and what has changed in the area and in the fens to make this possible or necessary, that is the question. Malacologists, as regular visitors to fen sites, have already been excluded from the possible vectors.

### ***Zonitoides arboreus* (Say, 1816)**

This species is native to North America and is now very common in moist greenhouses in CZ and SK. Shells of this species were found in a greenhouse in the substrate used for growing orchids. The orchids were exhibited during several months of public exhibition in the city of Strakonice.

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**Fig. 10.** The river Odra is inhabited by an extensive population of *Unio crassus* and also *Pseudanodonta complanata*. Photo by K. Beran.



**Fig. 11.** A Manor Park in the town of Stupava, Slovakia, the site of *Vertigo angustior*. A small wetland at the confluence of Stupavský potok (in the left part of the photo) and Vápeničný potok (streams). Photo by T. Čejka.

**Table 1.** Location data of the newly discovered occurrences reported herein.

Species; live/empty; Nearest municipality; Coordinates (°N, °E); Location (briefly) and habitat; Date of coll.; Altitude; leg./det.; Citation (if published)
<i>Alzoniella</i> sp.; 0/1; Volary; 48.8862, 13.8633; small peatbog pool in the river Teplá Vltava alluvium, 1 km NNE of Dobrá na Šumavě; 22. 8. 2018; 745; J. Sychra leg., M. Horsák det.
<i>Anisus septemgyratus</i> (Rossmässler, 1835); 1/0; Teplý vrch; 48.4721, 20.0928; SW tip of the Teplý vrch reservoir; 9. 6. 2021; 221; R. Cséfalvay leg., T. Čejka det.
<i>Arion intermedius</i> Normand, 1852; 1/0; Nasavrky; 49.8659, 15.7787; Slavice viewpoint, oak forest; 16. 5. 2021; 410; L. Juříčková
<i>Arion intermedius</i> Normand, 1852; 2/0; Běstvína; 49.8222, 15.5772; beech forest wetland above the river Doubrava; 29. 6. 2021; 330; K. Kubíková
<i>Cepaea nemoralis</i> (Linnaeus, 1758); 5/0; Drásov; 49.3319, 16.4844; private garden; 10. 5. 2021; 270; V. Šmardová
<i>Cornu aspersum</i> (O. F. Müller, 1774); 1/0; Chrudim; 49.954, 15.8017; Mikan horticulture; 7. 10. 2020; 240; P. Dolejš
<i>Cornu aspersum</i> (O. F. Müller, 1774); 1/0; Bratislava, Důbravka; 48.1751, 17.0607; Polianky Street; 13. 5. 2021; 200; S. Baranovič leg., T. Čejka det.
<i>Cornu aspersum</i> (O. F. Müller, 1774); 1/0; Diviacka Nová Ves; 48.7497, 18.4922; garden of the family house (close to the elevated cellar); 2. 8. 2021; 260; J. Oboňa leg., T. Čejka det.
<i>Cornu aspersum</i> (O. F. Müller, 1774); 1/0; Psáry, Praha-západ; 49.9505, 14.5177; lawn in Amos elementary school; 15. 7. 2021; 360; R. Kopanicová Mikulášová leg., R. Coufal det.
<i>Cornu aspersum</i> (O. F. Müller, 1774); 10/0; Řež; 50.1699, 14.3556; Flos horticulture, among trees; 11. 08. 2021; 175; P. Šmarda
<i>Gyraulus acronicus</i> (A. Férussac, 1807); 12/0; Hamr; 48.9391, 14.9143; S part of the pond Purkrabský rybník; 11. 6. 2021; 470; L. Beran, E. Šlachťová and others (Malacodays 2021)
<i>Gyraulus acronicus</i> (A. Férussac, 1807); 4/0; Hamr; 48.9467, 14.9193; N part of the pond Purkrabský rybník; 11. 6. 2021; 470; L. Beran, E. Šlachťová and others (Malacodays 2021)
<i>Gyraulus acronicus</i> (A. Férussac, 1807); 30/0; Staňkov; 48.9761, 14.9566; W edge of the pond Staňkovský rybník; 12. 6. 2021; 470; L. Beran, E. Šlachťová and others (Malacodays 2021)
<i>Gyraulus rossmaessleri</i> (Schmidt, 1852); 2/0; Lhota; 49.1312, 14.6673; Lhota u Dynína NM, seasonally flooded fen meadow; 12. 6. 2021; 420; M. Horsák et al.
<i>Gyraulus rossmaessleri</i> (Schmidt, 1852); 5/0; Lednice; 48.8112, 16.7978; sedge wetlands in the south part of the Pas-tvsko National Nature Reserve; 20. 3. 2021; 161; L. Beran
<i>Gyraulus rossmaessleri</i> (Schmidt, 1852); 26/0; Polanka nad Odrou; 49.7664, 18.1884; wetland by the pond Kačirek; 13. 3. 2021; 220; K. Beran leg., L. Beran det.
<i>Limacus flavus</i> (Linnaeus, 1758); 1/0; Stupava; 48.2742, 17.0300; on the pavement, Marcheggská Street; 8. 10. 2021; 178; T. Čejka leg., D. Szabóová det. (identified by DNA barcoding, BOLD database accession number SNMMo88, GenBank accession number OP270478)
<i>Limacus flavus</i> (Linnaeus, 1758); 1/0; Slatiňany; 49.9149, 15.8064; tree alley; 23. 6. 2021; 300; O. Machač leg., R. Coufal det.
<i>Limacus flavus</i> (Linnaeus, 1758); 1/0; Havraníky; 48.8118, 16.0084; pavement in front of main doors of the building; 25. 8. 2021; 290; R. Coufal
<i>Limacus maculatus</i> (Kaleniczenko, 1851); 6/0; Lednice; 48.7877, 16.8230; oak on the dam of the Mlýnský rybník; 11. 6. 2021, 5. 7. 2021; 200; R. Vlk
<i>Limacus maculatus</i> (Kaleniczenko, 1851); 1/0; Lednice; 48.7492, 16.7942; Rendez-vous NR, oak trunk by the pond; 5. 7. 2021; 200; R. Vlk
<i>Macrogastra badia</i> (C. Pfeiffer, 1828); 0/1; Neratov v Orlických horách; 50.2063, 16.5606; Neratovské louky NR; 17. 8. 2021; 590; T. Adamcová
<i>Monacha cartusiana</i> (O. F. Müller, 1774); dozens; Malý Újezd, near Mělník; 50.3292, 14.5377; grassland on road embankment; 1. 6. 2021; 190; S. Rada leg., R. Coufal det.
<i>Monacha cartusiana</i> (O. F. Müller, 1774); dozens; Strakonice; 49.2565, 13.8998; sunny wall, near the railway; 22. 7. 2021; 400; V. Hrdlička
<i>Monacha cartusiana</i> (O. F. Müller, 1774); 0/3; Zbůch; 49.6705, 13.2055; railway; 5. 6. 2021; 350; L. Dvořák

Table 1. Continued.

<i>Monacha cantiana</i> sensu lato; 44624; Bratislava; 48.1751, 17.0603; ten years abandoned area of the horticultural centre; 17. 9. 2021; 206; T. Čejka, J. Čapka leg., D. Szabóová det., (identified by DNA barcoding, GenBank accession numbers OP100310, OP100311, OP100312, OP100313)
<i>Oxychilus glaber</i> (Rossmässler, 1835); 1/0; Malenice; 49.1354, 13.8775; cave „Na Betani“; 28. 12. 2021; 555; L. Dvořák
<i>Physa acuta</i> Draparnaud, 1805; dozens; Tři Sekery; 49.9412, 12.6202; garden pond by a house No. 21; 16. 9. 2021; 665; L. Dvořák
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 40/0; Olšany; 49.1794, 15.5528; Řečice to the southeast of Olšany; 28. 10. 2021; 575; L. Beran; BERAN 2022
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 12/0; Vystrčenovice; 49.1698, 15.5514; Řečice upstream of a small bridge; 28. 10. 2021; 561; L. Beran; BERAN 2022
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 16/0; Vystrčenovice; 49.1663, 15.5500; Řečice 350 m upstream of the Nová Říše reservoir; 28. 10. 2021; 555; L. Beran; BERAN 2022
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 10/0; Vystrčenovice; 49.1736, 15.5492; Řečice to the east of the pond Vývozní rybník; 28. 10. 2021; 563; L. Beran; BERAN 2022
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 7/0; Vystrčenovice; 49.1644, 15.5495; Řečice on the northern edge of Nová Říše Nature Monument; 16. 10. 2021; 558; L. Beran; BERAN 2022
<i>Pisidium amnicum</i> (O. F. Müller, 1774); 3/0; Vystrčenovice; 49.1636, 15.5494; Řečice by its inflow into the Nová Říše reservoir; 16. 10. 2021; 557; L. Beran; BERAN 2022
<i>Pisidium globulare</i> Clessin, 1873; 1/0; Frahelž; 49.1209, 14.7395; V Lubu NR, shallow pool; 12. 6. 2021; 420; M. Horský et al.
<i>Pisidium globulare</i> Clessin, 1873; 2/0; Hrušovo; 48.5394, 20.0432; shaded wetland in alder carr; 11. 6. 2021; 294; R. Cséfalvay leg., T. Čejka det.
<i>Pisidium globulare</i> Westerlund, 1873; 8/0; Nová Ves nad Lužnicí; 48.8032, 14.9540; oxbow in the eastern part of the Krabonošská niva NR; 20. 6. 2021; 465; J. Beran leg., L. Beran det.; BERAN & BERAN 2021
<i>Pisidium globulare</i> Westerlund, 1873; 35/0; Nová Ves nad Lužnicí; 48.8029, 14.9539; sedge wetland on the eastern edge of the Krabonošská niva NR; 20. 6. 2021; 465; J. Beran leg., L. Beran det.; BERAN & BERAN 2021
<i>Pisidium globulare</i> Westerlund, 1873; 12/0; Polanka nad Odrou; 49.7641, 18.1827; small wetland at the SW tip of the pond Kačírek; 13. 3. 2021; 220; K. Beran leg., L. Beran det.
<i>Pisidium globulare</i> Westerlund, 1873; 40/0; Polanka nad Odrou; 49.7664, 18.1884; wetland by the pond Kačírek; 13. 3. 2021; 220; K. Beran leg., L. Beran det.
<i>Pisidium moitessierianum</i> Paladilhe, 1866; 6/0; Doksany; 50.4478, 14.1628; the river Ohře upstream of the weir in Doksany; 26. 8. 2021; 153; L. Beran
<i>Pisidium moitessierianum</i> Paladilhe, 1866; 2/0; Doksany; 50.4428, 14.1585; the river Ohře 1.2 km upstream of the weir in Doksany; 26. 8. 2021; 153; L. Beran
<i>Pisidium moitessierianum</i> Paladilhe, 1866; 7/0; Bohušovice nad Ohří; 50.4997, 14.1590; oxbow of the river Ohře to the NE of Bohušovice nad Ohří; 25. 6. 2021; 150; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 12/0; Staré Splavy; 50.5834, 14.6374; new pool by the SW bay of the pond Máchovo jezero; 26. 7. 2021; 275; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 24/0; Lysá nad Labem; 50.2150, 14.8281; pool in the SW tip of the Hrabanovská černava National Nature Monument; 2. 6. 2021; 183; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 23/0; Lázně Bohdaneč; 50.0987, 15.6659; pool in the SE part of NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 12/0; Lázně Bohdaneč; 50.0987, 15.6640; SW pool in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 15/0; Lázně Bohdaneč; 50.0990, 15.6649; pool by the canal in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Pisidium pseudosphaerium</i> Ehrmann, 1933; 17/0; Lázně Bohdaneč; 50.0992, 15.6653; northern pool by the canal in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Pisidium tenuilineatum</i> Stelfox, 1918; 1/0; Vystrčenovice; 49.1663, 15.5500; Řečice 350 m upstream of the Nová Říše reservoir; 28. 10. 2021; 555; L. Beran; BERAN 2022

**Table 1.** Continued.

<i>Pisidium tenuilineatum</i> Stelfox, 1918; 2/0; Vystrčenovice; 49.1698, 15.5514; Řečice upstream of a small bridge; 28. 10. 2021; 561; L. Beran; BERAN 2022
<i>Pisidium tenuilineatum</i> Stelfox, 1918; 2/0; Hovězí; 49.3029, 18.0800; canal of the river Bečva in the E edge of the camp; 4. 9. 2021; 375; L. Beran
<i>Pisidium tenuilineatum</i> Stelfox, 1918; 3/0; Hovězí; 49.3031, 18.0789; canal of the river Bečva in the camp; 4. 9. 2021; 375; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 8/0; Jince; 49.7710, 13.9605; Pond Mlýnský rybník; 10. 10. 2021; 468; V. Beranová leg., L. Beran det.
<i>Planorbis carinatus</i> O. F. Müller, 1774; 12/0; Záhvozdí; 48.8311, 13.9385; N part of the oxbow of the river Vltava to the N of Záhvozdí; 3. 8. 2021; 728; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 10/0; Pěkná; 48.8471, 13.9224; S part of the oxbow of the river Vltava to the SW of Pěkná; 22. 7. 2021; 728; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 18/0; Pěkná; 48.8473, 13.9231; central part of the oxbow of the river Vltava to the SW of Pěkná; 22. 7. 2021; 728; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 17/0; Pěkná; 48.8490, 13.9243; N part of the oxbow of the river Vltava to the SW of Pěkná; 22. 7. 2021; 728; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 30/0; Milovice; 50.2225, 14.8591; extensive pool in the NW part of Josefov; 2. 6. 2021; 195; L. Beran
<i>Planorbis carinatus</i> O. F. Müller, 1774; 4/0; Milovice; 50.2231, 14.8584; smaller pool in the NW part of Josefov; 2. 6. 2021; 195; L. Beran
<i>Potamopyrgus antipodarum</i> (Gray, 1843); 3/0; Jince; 49.7931, 13.9808; the stream Litavka in Jince; 5. 11. 2021; 370; L. Beran
<i>Potamopyrgus antipodarum</i> (Gray, 1843); 20/0; Hovězí; 49.3029, 18.0800; canal of the river Bečva in the E edge of the camp; 4. 9. 2021; 375; L. Beran
<i>Potamopyrgus antipodarum</i> (Gray, 1843); 35/0; Hovězí; 49.3031, 18.0789; canal of the river Bečva in the camp; 4. 9. 2021; 375; L. Beran
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 5/18; Tasovice; 48.8307, 16.1594; the river Dyje at the eastern edge of Tasovice; 26. 9. 2021; 200; L. Beran
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 1/0; Suchdol nad Odrou; 49.6342, 17.9461; the river Odra by the oxbow to the SE of Suchdol nad Odrou; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 3/0; Suchdol nad Odrou; 49.6279, 17.9394; the river Odra downstream of a weir to the W of Lesní Mlýn; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 2/0; Suchdol nad Odrou; 49.6304, 17.9441; the river Odra to the N of Lesní Mlýn; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 0/1; Valtířov; 50.6756, 14.1289; the river Labe in Valtířov; 19. 6. 2021; 145; V. Beranová leg., L. Beran det.
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 0/9; Stráž nad Nežárkou; 49.0804, 14.8819; the river Nežárka downstream of the weir Šimanov; 13. 6. 2021; 429; L. Beran
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 0/1; Hamr; 49.1579, 14.7669; the river Nežárka downstream of the weir in Hamr; 12. 6. 2021; 415; L. Beran
<i>Pseudanodonta complanata</i> (Rossmässler, 1835); 0/1; Břeclav; 48.7477, 16.8897; the river Dyje in Břeclav; 1. 5. 2021; 158; L. Beran
<i>Radix ampla</i> (Hartmann, 1821); 3/0; Švařec; 49.5201, 16.3437; the river Svratka in Švařec; 19. 8. 2021; 358; L. Beran
<i>Radix ampla</i> (Hartmann, 1821); 14/0; Koroužné; 49.5339, 16.3487; the river Svratka to the N of Koroužné; 19. 8. 2021; 368; L. Beran
<i>Radix lagotis</i> (Schrank, 1803); 17/0; Lázně Bohdaneč; 50.0992, 15.6653; northern pool by the canal in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Segmentina nitida</i> (O. F. Müller, 1774); 180/0; Trokavec; 49.6483, 13.7587; S edge of the pond Dolejší padrťský rybník; 29. 5. 2021; 635; V. Beranová leg., L. Beran det.
<i>Segmentina nitida</i> (O. F. Müller, 1774); 100/0; Trokavec; 49.6499, 13.7572; pools and wetlands by the SW bank of the pond Dolejší padrťský rybník; 29. 5. 2021; 635; V. Beranová leg., L. Beran det.

Table 1. Continued.

<i>Segmentina nitida</i> (O. F. Müller, 1774); 50/0; Trokavec; 49.6631, 13.7631; pond Výtažník; 6. 6. 2021; 635; V. Beranová leg., L. Beran det.
<i>Segmentina nitida</i> (O. F. Müller, 1774); 10/0; Trokavec; 49.6461, 13.7552; northwestern edge of the pond Hořejší padrťský rybník; 29. 5. 2021; 635; V. Beranová leg., L. Beran det.
<i>Segmentina nitida</i> (O. F. Müller, 1774); 40/0; Trokavec; 49.6579, 13.7604; western bank of the pond Dolejší padrťský rybník; 29. 5. 2021; 635; V. Beranová leg., L. Beran det.
<i>Sinanodonta woodiana</i> (Lea, 1834); 0/2; Příbice; 48.9419, 16.5703; the Jihlava river above the bridge in Bedřichův les; 10. 4. 2021; 200; M. Horsák et al.
<i>Sinanodonta woodiana</i> (Lea, 1834); 1/0; Trokavec; 49.6579, 13.7604; western bank of the pond Dolejší padrťský rybník; 29. 5. 2021; 635; V. Beranová leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 44289; Přesecka; 49.0479, 14.7379; Olšina u Přeseky NR, swampy alder carr; 11. 6. 2021; 420; M. Horsák et al.
<i>Sphaerium nucleus</i> (Studer, 1820); 15/0; Suchdol nad Odrou; 49.6339, 17.9448; southern part of the oxbow of the river Odra to the SE of Suchdol nad Odrou; 26. 6. 2021; 245; K. Beran leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 5/0; Lázně Bohdaneč; 50.0987, 15.6640; SW pool in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Sphaerium nucleus</i> (Studer, 1820); 2/0; Horka nad Moravou; 49.6221, 17.2339; small pool in the Plané Loučky NR; 18. 4. 2021; 218; L. Beran
<i>Sphaerium nucleus</i> (Studer, 1820); 13/0; Suchdol nad Odrou; 49.6334, 17.9448; pool to the SE of Suchdol nad Odrou; 26. 6. 2021; 245; K. Beran leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 3/0; Milotice; 48.9629, 17.1586; wetlands by the SE edge of the pond Písečný rybník; 11. 4. 2021; 184; K. Beran leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 5/0; Staré Splavy; 50.5833, 14.6377; new pool by the SW bay of the pond Máchovo jezero; 26. 7. 2021; 275; L. Beran
<i>Sphaerium nucleus</i> (Studer, 1820); 7/0; Polanka nad Odrou; 49.7750, 18.1900; pool by the eastern edge of the pond Nádražní rybník; 13. 3. 2021; 220; K. Beran leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 30/0; Suchdol nad Odrou; 49.6345, 17.9451; northern part of the oxbow of the river Odra to the SE of Suchdol nad Odrou; 26. 6. 2021; 245; K. Beran leg., L. Beran det.
<i>Sphaerium nucleus</i> (Studer, 1820); 3/0; Horka nad Moravou; 49.6222, 17.2324; overgrown shallow pool in reeds in the Plané Loučky Nature Reserve; 18. 4. 2021; 200; L. Beran
<i>Sphaerium nucleus</i> (Studer, 1820); 3/0; Lázně Bohdaneč; 50.0990, 15.6649; pool by the canal in the NW bay of the pond Bohdanečský rybník; 22. 5. 2021; 218; L. Beran
<i>Sphaerium nucleus</i> (Studer, 1820); 35/0; Libice nad Cidlinou; 50.1078, 15.1663; pool to the NE of Oseček in the Libický luh NNR; 14. 5. 2021; 185; L. Beran
<i>Tandonia kusceri</i> (Wagner, 1931); 1/0; Dunajská Streda; 48.0001, 17.6246; cemetery; 19. 5. 2021; 114; T. Čejka
<i>Tandonia kusceri</i> (Wagner, 1931); 7/0; Zvolen; 48.5806, 19.1436; cemetery; 6. 5. 2021; 325; T. Čejka
<i>Theodoxus danubialis</i> (C. Pfeiffer, 1828); 13/0; Břeclav; 48.7094, 16.9052; the river Dyje 2 km to the S of Pohansko; 1. 5. 2021; 158; L. Beran
<i>Theodoxus danubialis</i> (C. Pfeiffer, 1828); 45/0; Břeclav; 48.7135, 16.9038; the river Dyje 1.5 km to the S of Pohansko; 1. 5. 2021; 158; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 1/0; Lochenice; 50.2801, 15.8301; the stream Trotina on the northern edge of the Trotina Nature Monument; 5. 6. 2021; 237; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 8/0; Suchdol nad Odrou; 49.6347, 17.9461; the river Odra by the oxbow to the SE of Suchdol nad Odrou; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 1/0; Suchdol nad Odrou; 49.7828, 18.2030; the river Odra by the southern edge of Polanský les Nature Reserve; 2. 5. 2021; 210; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 7/0; Suchdol nad Odrou; 49.6304, 17.9441; the river Odra to the N of Lesní Mlýn; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 15/0; Jeseník nad Odrou; 49.6182, 17.9254; the river Odra downstream of the inflow of the river Luha; 4. 7. 2021; 255; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 3/0; Polanka nad Odrou; 49.6182, 17.9254; the river Odra downstream of the inflow of the river Polančice; 4. 4. 2021; 210; K. Beran leg., L. Beran det.

**Table 1.** Continued.

<i>Unio crassus</i> Philipsson, 1788; 9/0; Suchdol nad Odrou; 49.6424, 17.9563; the river Odra to the E of Suchdol nad Odrou; 25. 7. 2021; 248; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 5/0; Suchdol nad Odrou; 49.6279, 17.9394; the river Odra downstream of a weir to the W of Lesní Mlýn; 26. 6. 2021; 240; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 17/0; Suchdol nad Odrou; 49.6395, 17.9532; the river Odra upstream of a railway; 25. 7. 2021; 248; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 15/0; Jeseník nad Odrou; 49.6174, 17.9239; the river Odra upstream of the inflow of the river Luha; 4. 7. 2021; 255; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 1/0; Svinov; 49.7933, 18.2146; the river Odra 200 m upstream of a railway; 2. 5. 2021; 210; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 3/0; Polanka nad Odrou; 49.7748, 18.1945; the river Odra 300 m upstream of a road; 4. 4. 2021; 220; K. Beran leg., L. Beran det.
<i>Unio crassus</i> Philipsson, 1788; 5/0; Hamr; 49.1579, 14.7669; the river Nežárka downstream of a weir in Hamr; 12. 6. 2021; 415; L. Beran, E. Šlachtová and others (Malacodays 2021)
<i>Unio crassus</i> Philipsson, 1788; 250/0; Hovězí; 49.3031, 18.0789; canal of the river Bečva in the camp; 4. 9. 2021; 375; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 100/0; Hovězí; 49.3029, 18.0800; canal of the river Bečva in the E edge of the camp; 4. 9. 2021; 375; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 1/0; Olomouc; 49.5728, 17.2628; the river Morava by the railway; 11. 11. 2021; 245; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 0/2; Olomouc; 49.5831, 17.2618; the river Morava by the bridge; 11. 11. 2021; 245; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 2/0; Hynkov; 49.6744, 17.1735; the river Morava 150 m downstream of a weir; 17. 4. 2021; 220; L. Beran
<i>Unio crassus</i> Philipsson, 1788; 27/0; Senožaty; 49.5739, 15.1811; the stream Martinický potok by the bridge; 8. 5. 2021; 443; L. Beran
<i>Vertigo angustior</i> Jeffreys, 1830; 44837; Stupava; 48.2758, 17.0345; small wetland in a stream floodplain; 6. 10. 2021; 196; J. Čačaný, T. Čejka
<i>Vertigo angustior</i> Jeffreys, 1830; 8/0; Lhota; 49.1308, 14.6699; Lhota u Dynína NM, sedge meadow; 12. 6. 2021; 420; M. Horsák et al.
<i>Vertigo moulinsiana</i> (Dupuy, 1849); 3/39; Vyškovec; 49.1315, 18.0353; Chmelínek NM; 23. 7. 2021; 440; J. Škodová leg., M. Horsák det.
<i>Vertigo moulinsiana</i> (Dupuy, 1849); 44652; Strání; 48.8833, 17.7000; Mechnáčky NM; 4. 9. 2021; 500; J. Škodová leg., M. Horsák det.
<i>Zonitoides arboreus</i> (Say, 1816); 44197; Strakonice; 49.2641, 13.9169; greenhouse, orchid exhibition; 17. 4. 2021; 395; V. Hrdlička