

## Present knowledge of distribution of *Tandonia budapestensis* (Hazay, 1881) in the Czech and Slovak Republics (Gastropoda: Milacidae)

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**Abstract:** All published and known unpublished data on *Tandonia budapestensis* (Hazay, 1881) from the territory of the Czech and Slovak Republics are summarised. This species occurs rarely in both states in altitudes up to ca. 420 m. and is closely bound to anthropogenous habitats.

**Key words:** *Tandonia budapestensis*, geographic distribution, ecology, spreading, Central Europe.

### Introduction

*T. budapestensis* is known to occur predominantly in secondary habitats (cemeteries, greenhouses etc.) in big towns, where it was also found in Bohemia, Moravia and Slovakia. The fossil remnants of *Tandonia* species can be identified, unlike other naked slugs, by typical concentric accretion lines on the internal shell plates. Other autochthonous naked slugs in fossil records can be identified only at generic level, or they are not conserved at all (fam. Arionidae). This fact does not allow to distinguish what species is autochthonous in our fauna and what colonized our territory only ca. 100–150 years ago when the mollusc fauna had not still been studied. Due to reasons mentioned above we are able only to formulate hypotheses about recent genesis of our fauna. For example, some slug species of cultural landscape like *Oxychilus cellarius* were probably imported into Bohemia, Moravia and Slovakia already in Middle Ages.

According to character and number of known localities, some authors supposed *T. budapestensis* to be introduced into Bohemia, Moravia and Slovakia recently (Hudec, V. 1963). However, this presumption cannot be verified or rejected. We must consider that every species colonizes new area in different way, according to habitat and spreading speed. As an example a surprisingly quickly spreading allochthonous species we can mention *Boettgerilla pallens* and *Arion lusitanicus*, which colonised different types of habitats on the almost whole territory of the former Czechoslovakia. Although *T. budapestensis* is known to occur in our countries for a long time, it has been recorded in very few localities, perhaps due to its inability to acclimatize sufficiently. Bound of this species to warm lowland areas support the above opinions.

### History of occurrence in Bohemia, Moravia and Slovakia

Only two localities of *T. budapestensis* from Prague were known in the late 19th century (Uličný, J. 1892–95). About 50 years later, Ložek, V. (1948) published more localities, but also only from Prague. Ten years later, he published (Ložek, V. 1956) a new locality in surroundings of the Ostrava. Than *T. budapestensis* started to be observed in other parts of the

territory, mainly in Bohemia: surrounding of Ostrava (Hudec, V. & Mácha, S. 1961), Teplice (Flasar, I. 1962, Flasarová, M. & Flasar, I. 1962), piedmont of the Orlické hory Mts., Brandýs nad Labem, and Prague (Hudec, V. 1963). There were no verified records from Slovakia (Hudec, V. 1963). In the following years, only two records from the greenhouses in Brno were published (Ditrich, O. 1974). The first findings from Slovakia come from the Zemplínské vrchy Mts. (Bába, K. 1974) and from Devičany, in southern parts of the Štiavnické vrchy Mts. (Lisický, M. J. 1979). Some earlier found specimens were found in some Bohemian museums. New data were registered in other regions in 1990s, in Bohemia from Netolice, and Hradec Králové in Moravia from surroundings of Olomouc, Znojmo, and, from piedmont of the White Carpathians; in Slovakia from the Štiavnické vrchy Mts. and Bratislava. Some of these data were published by Juříčková, L. (1998) and Flasar, I. (1998).

### Published data

Data are given as follows: number of the quadrat of the faunistic mapping grid (according to Pruner, L. & Míka, P. 1996), site characteristics and references. Deposition of specimens in museum collections is given by abbreviations: coll. NMP – National Museum Prague, coll. SZMO – Silesian Regional Museum in Opava.

### Czech Republic: Bohemia

**5348:** Teplice-Novosedlice, greenhouses in the Hřbitovní ulice Street 303 (Flasarová, M. & Flasar, I. 1962); Teplice-Nový Mstišov, greenhouses in the Polní ulice Street 282 (Flasarová, M. & Flasar, I. 1962); Duchcov, castle garden (Flasar, I. 1998); Teplice, castle garden (Flasar, I. 1962, 1998); **5349:** Teplice-Trnovany, greenhouses in the ulice E. Dvořákové Street 17 (Flasarová, M. & Flasar, I. 1962); Teplice, Doubravská Hora hill (Flasar, I. 1962, 1998); **5549:** Třebívlice, the Bažantnice forest (Flasar, I. 1998); **5662:** Nové Město nad Metují, garden (Ptáček in Hudec, V. 1963, Brabenec, J. 1978, coll. NMP); Malá Skalice, the Úpa River valley, near the market garden (Brabenec, J. 1978, coll. NMP); **5761:** Hradec Králové, Žižkovy Sady (Juříčková, L. 1998); **5852:** Prague, hillside in Podbaba (Ložek, V. 1948, Zavadil in Hudec, V. 1963); **5853:** Brandýs nad Labem, castle garden (Němec in Hudec 1963); **5951:** Prague, Bílá Hora (Juříčková, L. 1995); **5952:** Prague, Malostranský Hřbitov cemetery in Košíře (Ložek, V. 1948, Ložek in Hudec, V. 1963); Prague, Hlubočepy district (Hudec, V. 1963); Prague, gardens and cemetery near Malvazinka (Hudec, V. 1963, coll. NMP, coll. SZMO); Prague, Jinonice (Hudec, V. 1963); Prague, Vinohrady, gardens (Ložek, V. 1948, Babor in Hudec, V. 1963); Prague, Santoška Park (Hudec, V. 1963); Prague, Paví Vrch hill (Hudec, V. 1963); Prague, Petřín (Ložek, V. 1948, Ložek in Hudec, V. 1963); Prague, Zlíchov (Ložek, V. 1948, Jandečka in Hudec, V. 1963); Prague, Jelení Příkop (Uličný, J. 1892–95, Ložek, V. 1948, Košťál in Hudec, V. 1963); Prague, Strahovská Zahrada (Uličný, J. 1892–95, Košťál in Hudec, V. 1963); Klukovice, eastern margin of the village (Hudec, V. 1963); Prague, Kinského Zahrada (Jandečka in Hudec, V. 1963, Juříčková, L. 1995); Prague, Motolský Úval, Cibulecký Háj (Juříčková, L. 1995); Prague, Skalka near Košíře (Juříčková, L. 1995); Prague, Košíře, Bertramka (Juříčková, L. 1995); **5953:** Prague, Skalka, Slatinský Potok creak (Juříčková, L. 1995); Prague, Uhříněves, alluvium of the Říčanka river (Juříčková, L. 1995); **6052:** Prague, Cholupická bažantnice pheasantry (Juříčková, L. 1995).

## Czech Republic: Moravia and Silesia

6175: Ostrava, the right bank of the Ostravice river close to the confluence with the Lučina river (Hudec, V. & Mácha, S. 1961, coll. NMP); Ostrava, at road to Lučina near the ruin of the Slezskoostravský Zámek castle (Hudec, V. & Mácha, S. 1961, coll. SZMO); Vítkovice, courtyard of Vítkovické Železárny iron-works (Mácha in Hudec, V. 1963); 6177: Ráj near Darkov, the left bank of the Olza river (Ložek, V. 1956, Ložek in Hudec, V. 1963); 6275: Paskov, the right bank of the Ostravice river, Vratimovské Luhy floodplain (Hudec, V. & Mácha, S. 1961, coll. NMP); 6469: Olomouc, greenhouses of the botanical garden (Mácha, S. 1971, coll. SZMO); 6765: Brno, greenhouse of the botanical garden of Faculty of Natural Sciences (Ditrich, O. 1974), Brno, greenhouse in the Lužánky park (Ditrich, O. 1974).

## Slovakia

**7596:** Veľká Třňa, 16 km southerly from Trebišov, eighty years old oak-hornbeam forest (Bába, K. 1974); **7679:** Devičany, 14 km NE from Levice (Lisický, M. J. 1979); **8178:** Kováčov near Štúrovo (Brabenec and Mácha in Lisický, M.J. 1991, coll. NMP et SZMO).

## Recent unpublished data

Data are given in the same form as in the previous chapter, but more detailed site description dates of collection and collector's name are added. Present distribution of *T. budapestensis* in the Czech and Slovak Republics see on the Fig.1.

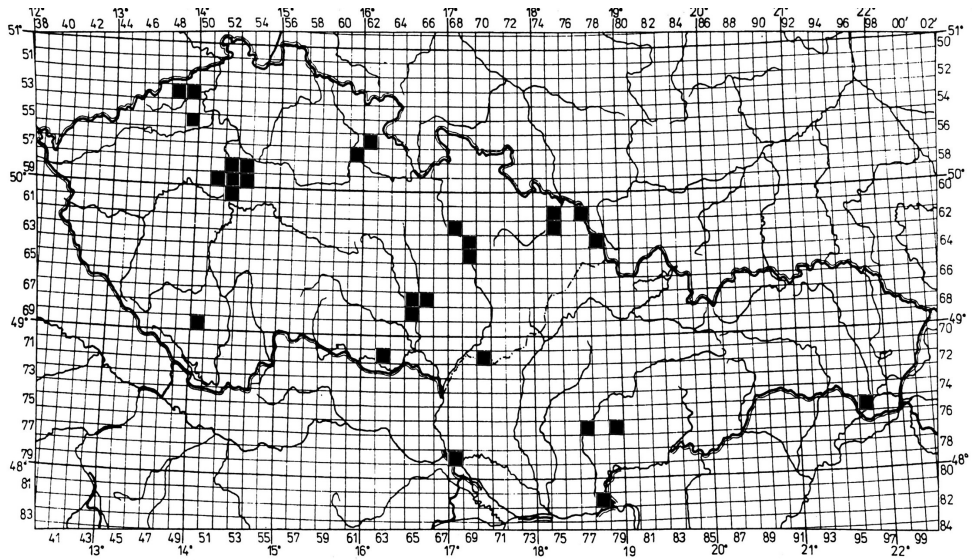


Fig. 1. Present known distribution of *T. budapestensis* in the Czech Republic and Slovakia.

## Czech Republic: Bohemia

**5952:** Prague 5 – Košíře, Klamovka, 29. 6. 1983, V. Pflieger lgt., coll. NMP; Prague 5 – Plzeňská ulice, Malostranský Hřbitov, 17. 5. 1983, V. Pflieger lgt., coll. NMP; Prague 3 – Žižkov, northern slope below the monument, 4. 11. 1998, V. Pflieger lgt., coll. NMP; Prague 3 – Židovské Hřbitovy cemetery, 6. 9. 1979, V. Pflieger lgt., coll. NMP; **6950:** Hrbov near Netolice, abandoned damp meadow near allotments under embankment of a pond, 420 m a. s. l., 9 July 2002, O. Ditrich lgt. et det.

## Czech Republic: Moravia and Silesia

**6268:** Uničov-Brničko, basement, 30. 9. 2001, M. Mañas; Uničov-Brničko, field, 25. 7. 2002, M. Mañas; **6369:** Olomouc-Černovír, the margin of allotted gardens, 4. 8. 2001, M. Mañas; **6378:** Třinec, the brook near the motorway E of the hospital, 18. 10. 1966, S. Mácha (coll. SZMO); **6469:** Olomouc-Slavonín, allotments, 1. 5. 2001, M. Mañas, Olomouc-Bělidla, ulice Táboritů street 23, garden, 12. 4. 2003, M. Mañas; **6765:** Brno, greenhouses of the arboretum of the Mendel's University of Agriculture and Forestry, 15. 11. 2001, L. Dvořák et M. Horsák; **6766:** Brno-Líšeň, 26. 6. 2001, O. Ditrich; **6865:** Brno-Bohunice, Central Cemetery, 9. 7. 1997, M. Horsák; **7163:** Božice near Znojmo, 3. 8. 1999, O. Ditrich.; **7170:** Hrubá Vrbka, ruderal site in the village interior, 4. 10. 2002, P. Kment lgt., M. Horsák det.

## Slovakia

**7677:** Čajkov, 8 km N from the Levice, vineyards, 5. 4. 1990, J. Šteffek lgt. et det.; **7868:** Bratislava, Cintorín u Kozej Brány (cemetery, the Timravina ulice street), 3. 12. 2002, L. Dvořák et T. Čejka lgt., L. Dvořák det. et coll.; Bratislava, the ruderal site at the left bank of the Danube near the Lanfranconi bridge (between dockyard and Dvořákovo Nábřežie embankment), 3. 12. 2002, L. Dvořák et T. Čejka lgt.

### Distribution in some adjacent countries

*Tandonia budapestensis* is also known to occur in the adjacent countries, for example. The species is very frequent in the Danube alluvium on the Moravian–Slovak–Austrian–Hungarian borderland. The distribution in the Germany was not included in this work because the species occurs only in the South Bavaria, far from the Bohemian border. In Poland, it occurs only as ruderal species. It is known only from two localities in the South, one of the localities is connected with Moravian Silesia (Wiktor, A. 1989). In Austria, the species is also occurs in the cultural landscape and it is widespread in the whole country. Remarkable is a high concentration of its occurrence in the northeast in the Danube floodplain (Reischütz, P. L. 1986), which forms, together with other localities in Austria, Moravia and Slovakia a large continuous area. In Hungary, the species occurs (as a ruderal species) in small areas dispersed all over country. (Wiktor, A. & Szigethy, A. S. 1983). The distribution of *Tandonia budapestensis* in the Central Europe is shown on Fig. 2.

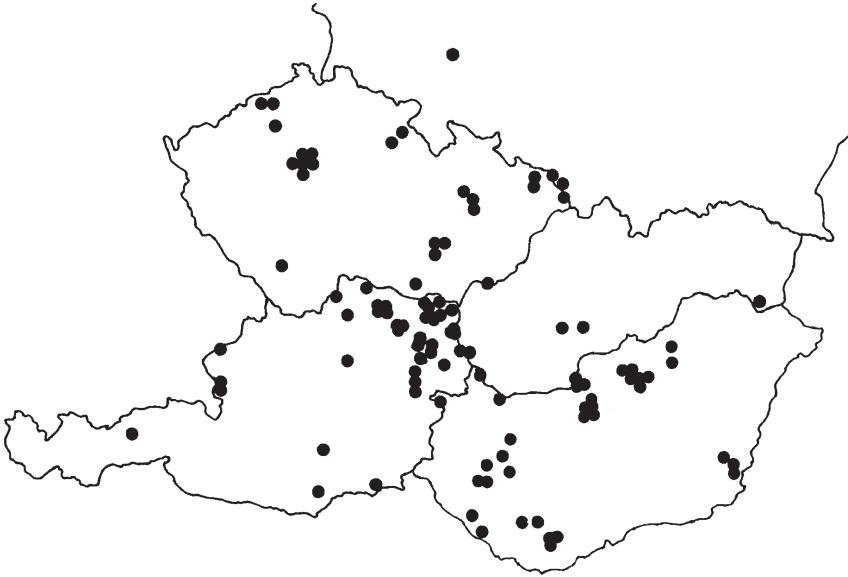


Fig. 2. Distribution of *T. budapestensis* in central Europe. Data from adjacent countries are drawn from following studies: Poland (Wiktor, A. 1989), Austria (Reischütz, P. L. 1986), and Hungary (Wiktor, A. & Szigethy, A. S. 1983).

### Ecology

The natural distribution area of *T. budapestensis* laid probably in South Europe species (Kerney, M. P. *et al.* 1983), and gradually expanded to some areas of the Central and Western Europe. In the Central Europe, *T. budapestensis* occurs especially close to settlements or in ruderal habitats (Hudec, V. 1963, Reischütz, P. L. 1986, Wiktor, A. 1989). Based on the secondary character of localities known in the past, many malacologists concluded that *T. budapestensis* has been introduced to Bohemia, Moravia and Slovakia recently (Hudec, V. 1963).

*T. budapestensis* occurs at lowest altitudes, all localities known in Austria lie at altitudes of 140–530 m. (Reischütz, P. L. 1986). Similarly – most localities in Bohemia and Moravia lie between 170–270 m a. s. l. (maximum is 420 m, Hrbov near Netolice, South Bohemia). In Slovakia, most localities lie a little lower – 105–220 m a.s.l., maximum is 320 m (Devičany). *T. budapestensis* is associated mainly to plain areas and never occur in hilly diversified areas. Unlike other species of cultural landscape (e.g. *Deroceras reticulatum*, *Arion distinctus* or *A. lusitanicus*) showing a wide range of vertical distribution, *T. budapestensis* probably prefers warmer areas with well-balanced climate.

### Sozological status

*T. budapestensis* is classified into category of the least concern species (LC) in the red list of Bohemian molluscs (Juříčková, L. *et al.* 2001). In the future, creating of a separate category it will be desirable for species of cultural landscape. From this point of view, assess-

ment of those species is impossible. Problem of all ruderal slugs is impossibility of accurate assessment of their nature conservation status. This fact closely bears on indisposition of slug determination in fossil records.

### Summary

In the past, in Czechoslovakia little attention was paid to the occurrence and spreading of ruderal molluscan fauna. One of the typical, but neglected slug is *Tandonia budapestensis* (Hazay, 1881). At present, *T. budapestensis* occurs in the Czech Republic in 24 quadrats of faunistic mapping grid, the major part of records comes from Prague and its vicinity. In Slovakia, *T. budapestensis* is known to occur in 5 quadrats.

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