

TERRESTRIAL ISOPODS IN SUBTERRANEAN HABITATS OF THE CZECH REPUBLIC

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Introduction

As a result of glaciation, Central European cave systems have a much poorer invertebrate fauna compared to caves in Southern Europe. The cave fauna known from the Czech Republic consists mainly of troglomenes and trogloniles, typical trogloniles are absent in most invertebrate groups. Biospeleological research started in the Moravian Karst with Jindřich Wankel during the second half of the 19th century. His grandson, Karel Absolon, was the leading person to explore the Moravian Karst from 1909 to 1933 (ABSOLON 1970) and was followed by several other authors. Historical publications documenting the research of subterranean fauna have been surveyed by BOSÁK et al. (2001). More detailed biospeleological research was initiated at the beginning of this millennium. An extensive data sets also reporting on terrestrial isopod species were obtained within the framework of two projects supported recently by the Nature Conservation Agency of the Czech Republic (NCA CR).

Methods

- Individual sampling in various cave microhabitats (walls, substrates, woods, debris etc.)
- Pitfall trapping with different killing-preserving fixation solution (ethylene glycol/beer, alcohol, formaldehyde) and different time of exposition (from 1 month to 1 year)
- Heat extraction of invertebrates from exposed baits (moist sterile leaf litter, wood material) and cave substrates (wood, litter, bat guano, sediments)
- More than 60 of the most important karst cave systems and over 60 partial non-karst localities explored, mostly with positive findings of isopods (Figures 1 and 2).
- Within the framework of the NCA CR projects, 63 representative cave systems (mostly karstic) investigated in detail with detail monitoring on 162 stationary plots.

Table 1 – Terrestrial isopods recorded in the karstic caves and other non-karstic subterranean systems of the Czech Republic. TP-TX – species considered as troglonile / local troglonile, TX – troglonile, and numbers of localities with occurrence of species.

		Localities		ind.
		Karst	Non-karst	
TP-TX	<i>Androniscus dentiger</i> Verhoeff, 1908	1		563
TP-TX	<i>Androniscus roseus</i> (C. Koch, 1838)	7	2	76
TX	<i>Armadiididium pictum</i> Brandt, 1833	1	3	39
TX	<i>Armadiididium pulchellum</i> (Zenker, 1798)		1	1
TX	<i>Armadiididium versicolor</i> Stein, 1859	3	1	7
TX	<i>Armadiididium vulgare</i> (Latreille, 1804)	6	7	1012
TP-TX	<i>Cylisticus convexus</i> (De Geer, 1778)	20	6	478
TX	<i>Haplophthalmus dannicus</i> Budde-Lund, 1880	1		7
TP-TX	<i>Haplophthalmus mengii</i> (Zaddach, 1844)	13	1	211
TX	<i>Hyloniscus riparius</i> (C. Koch, 1838)	19	7	142
TX	<i>Lepidoniscus minutus</i> (C. Koch, 1838)	1	2	10
TX	<i>Ligidium germanicum</i> Verhoeff, 1901	2		2
TX	<i>Ligidium hypnorum</i> (Cuvier, 1792)	1	2	5
TX	<i>Oniscus asellus</i> Linnaeus, 1758	16	10	99
TX	<i>Platyarthrus hoffmannseggii</i> Brandt, 1833	1	1	2
TX	<i>Porcellio scaber</i> Latreille, 1804	2	6	45
TX	<i>Porcellio spinicornis</i> Say, 1818	3	4	13
TX	<i>Porcellionides pruinosus</i> (Brandt, 1833)		1	1
TX	<i>Porcellium collicola</i> (Verhoeff, 1907)	2	3	11
TX	<i>Porcellium conspersum</i> (C. Koch, 1841)		10	28
TX	<i>Protracheoniscus politus</i> (C. Koch, 1841)	5	23	99
TX	<i>Trachelipus nodulosus</i> (C. Koch, 1838)	1		19
TX	<i>Trachelipus rathkii</i> (Brandt, 1833)		3	42
TX	<i>Trachelipus ratzeburgii</i> (Brandt, 1833)	5	17	75
TX	<i>Trichoniscus alemannicus</i> Verhoeff, 1917		1	7
TX	<i>Trichoniscus pusillus</i> Brandt, 1833	5	1	21
TP-TX	<i>Trichoniscus pygmaeus</i> Sars, 1898	10		94
Number of recorded species (individuals)		22	22	(3109)

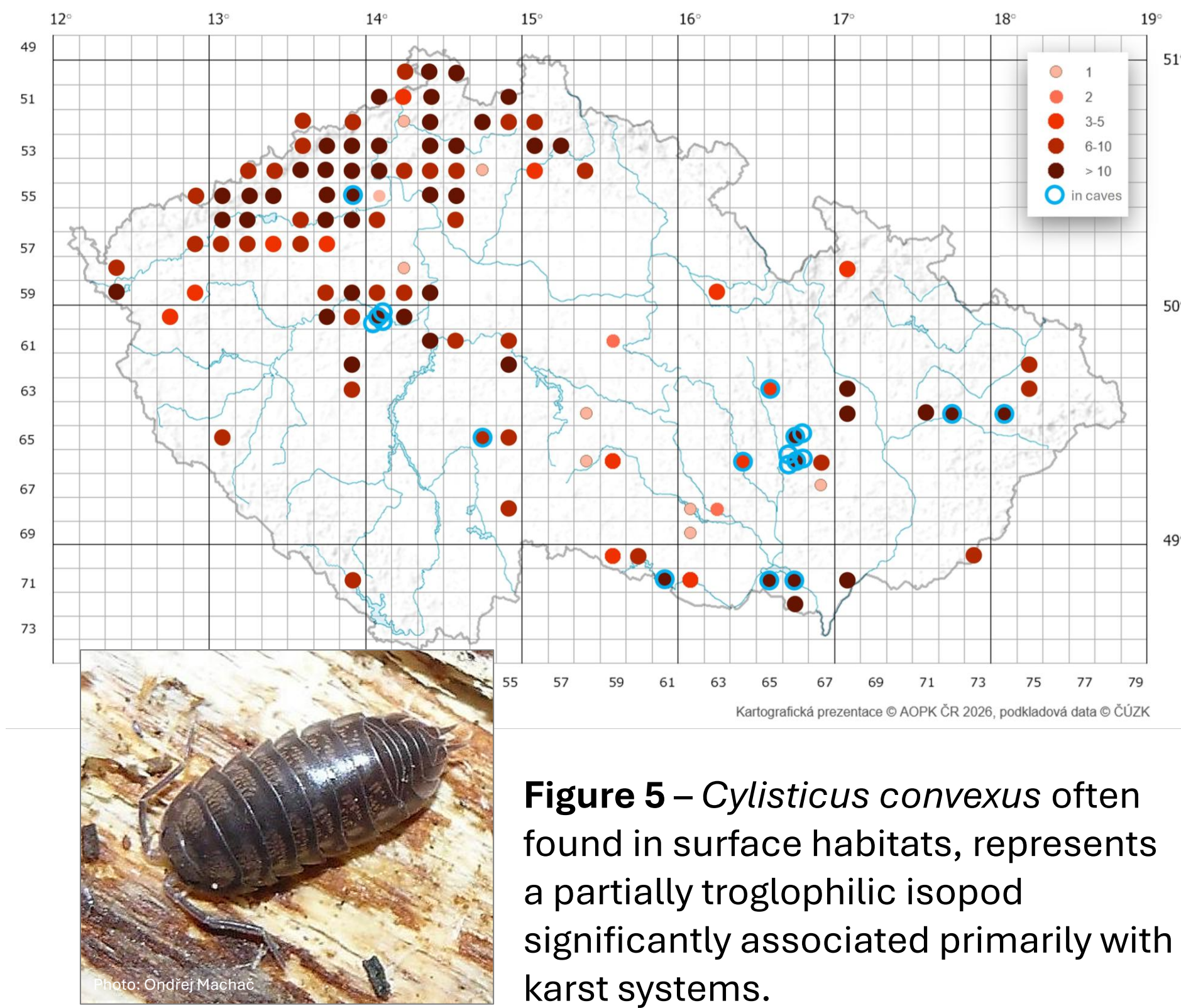


Figure 5 – *Cylisticus convexus* often found in surface habitats, represents a partially troglonile isopod significantly associated primarily with karst systems.

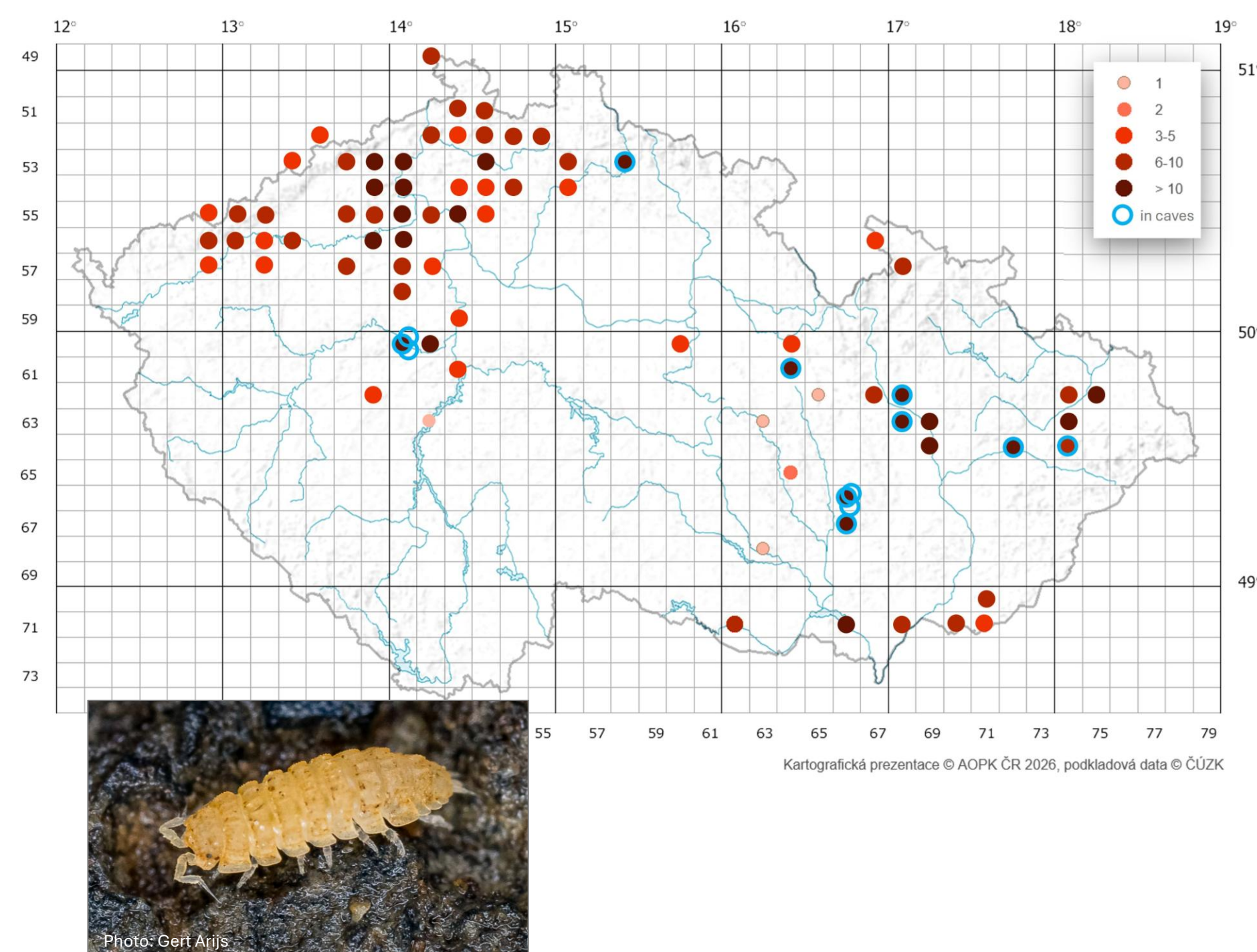


Figure 6 – *Haplophthalmus mengii*, as a representative of the ecomorphological type creeper, is the second most frequently occurring representative in karst caves, but not in high numbers of individuals.

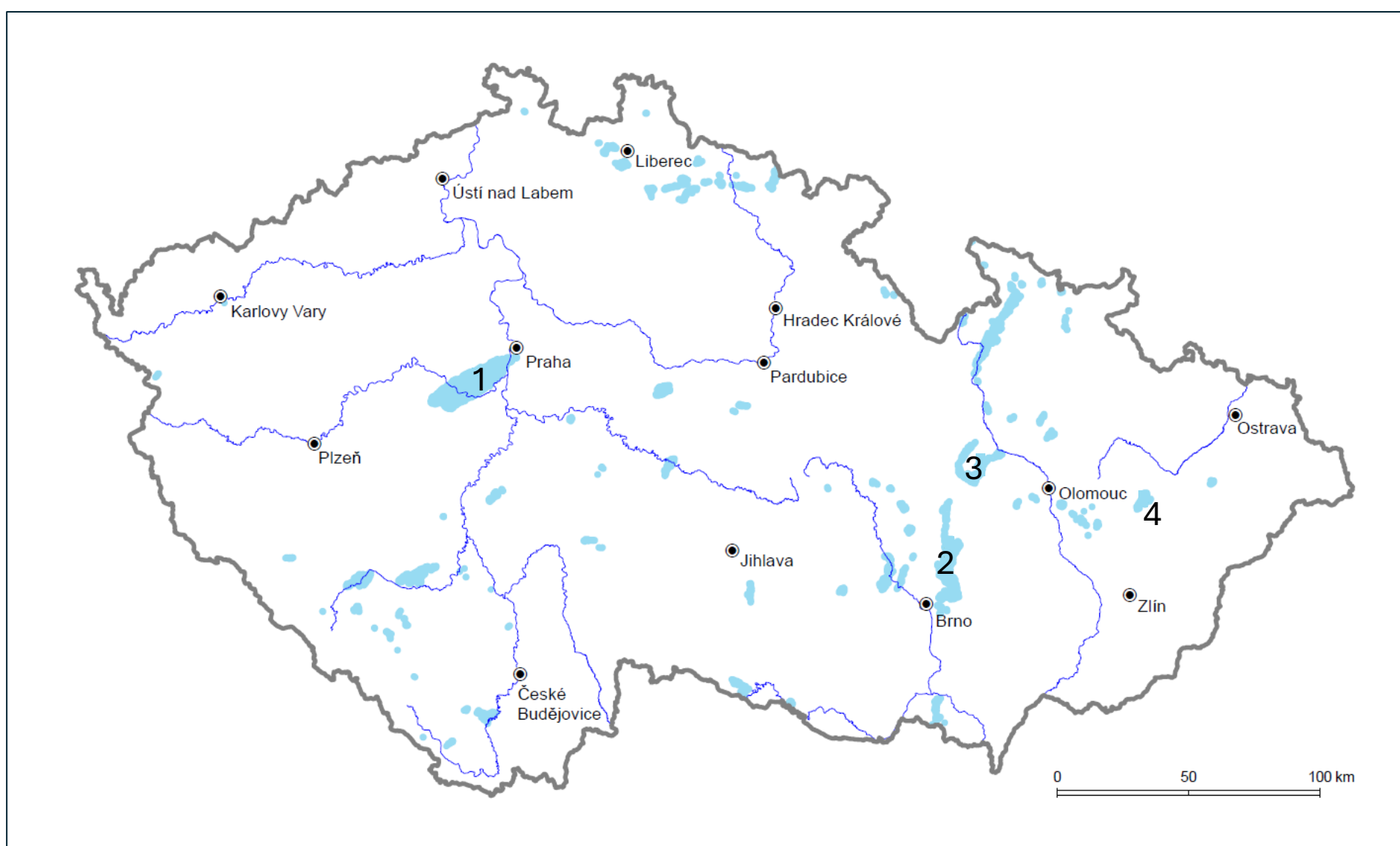


Figure 1 – Principal karst areas in the Czech Republic (in blue). 1 – Bohemian Karst, 2 – Moravian Karst, 3 – Mladeč and Javoříčko Karst, 4 – Hranice Karst.

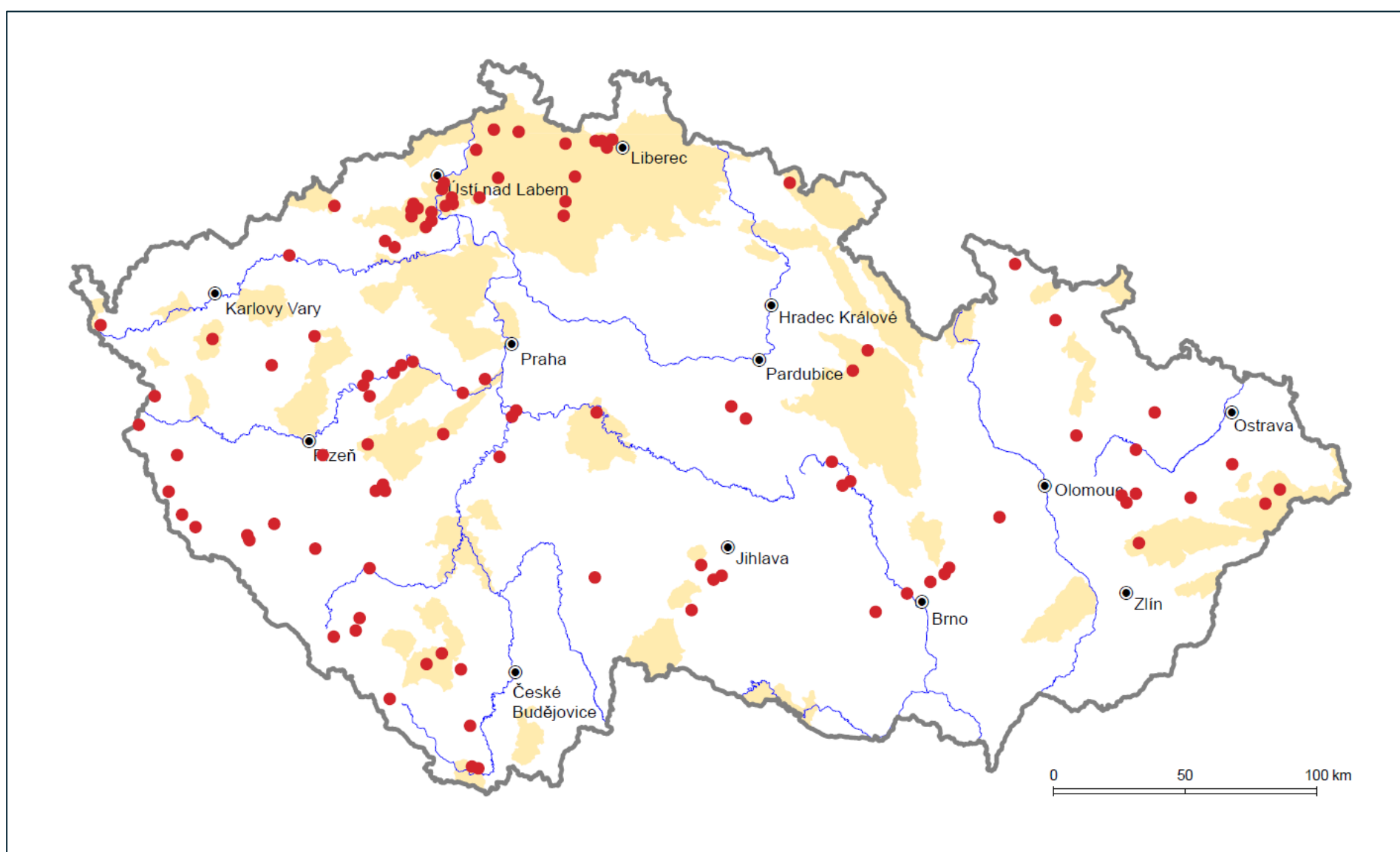


Figure 2 – Principal areas with occurrences of caves in non-karstic rocks in the Czech Republic (in ochre). • – nature reserves with protected scree slope ecosystems.

Results

Although troglonile representatives of terrestrial isopods are almost completely absent in Central Europe, research conducted in the Czech Republic over the past few decades has collected relatively rich data on the occurrence of these arthropods in diverse underground habitats. Summary of recent findings of 27 species recorded in karstic and non-karstic underground systems is presented (Table 1). Karstic and non-karstic systems are similarly populated in terms of the total number of species. The species significantly represented in karst caves include *A. dentiger*, *C. convexus*, *H. mengii* and *T. pygmaeus*; of these, *C. convexus* and also the troglonile *O. asellus* were most frequently found. In non-karstic systems, surface species predominate, of which *A. vulgare* was found most frequently, *P. politus* and *T. ratzeburgii* also often penetrate the subterranean habitats.

The results of previous research show that Central European underground biotopes represent a very interesting and important refuge for a wide spectrum, including some relatively rare faunal elements of terrestrial isopods with a less known or questionable distribution throughout the Europe.

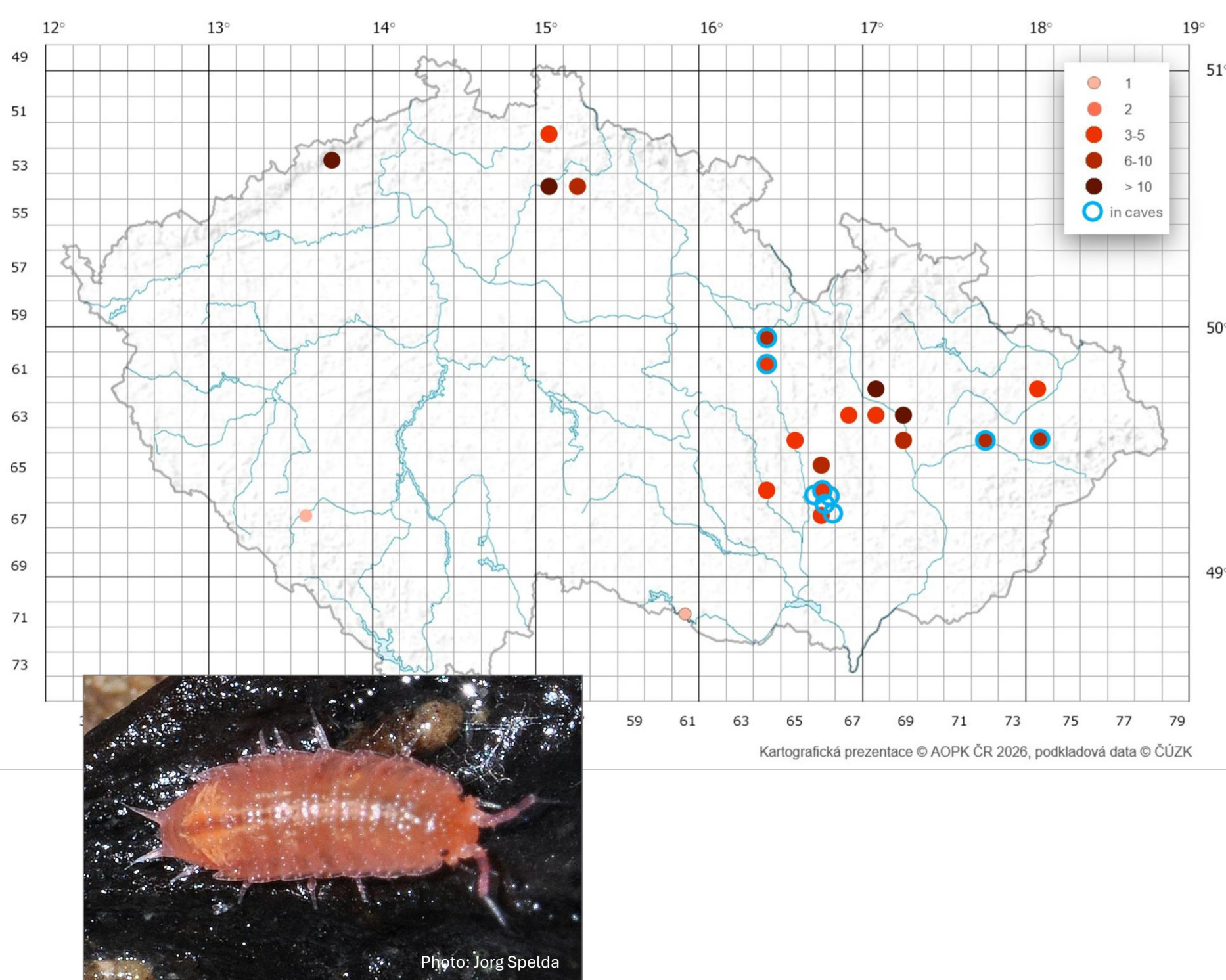


Figure 3 – *Androniscus roseus* with occurrence in karstic and non-karstic habitats only in Eastern part of the country.

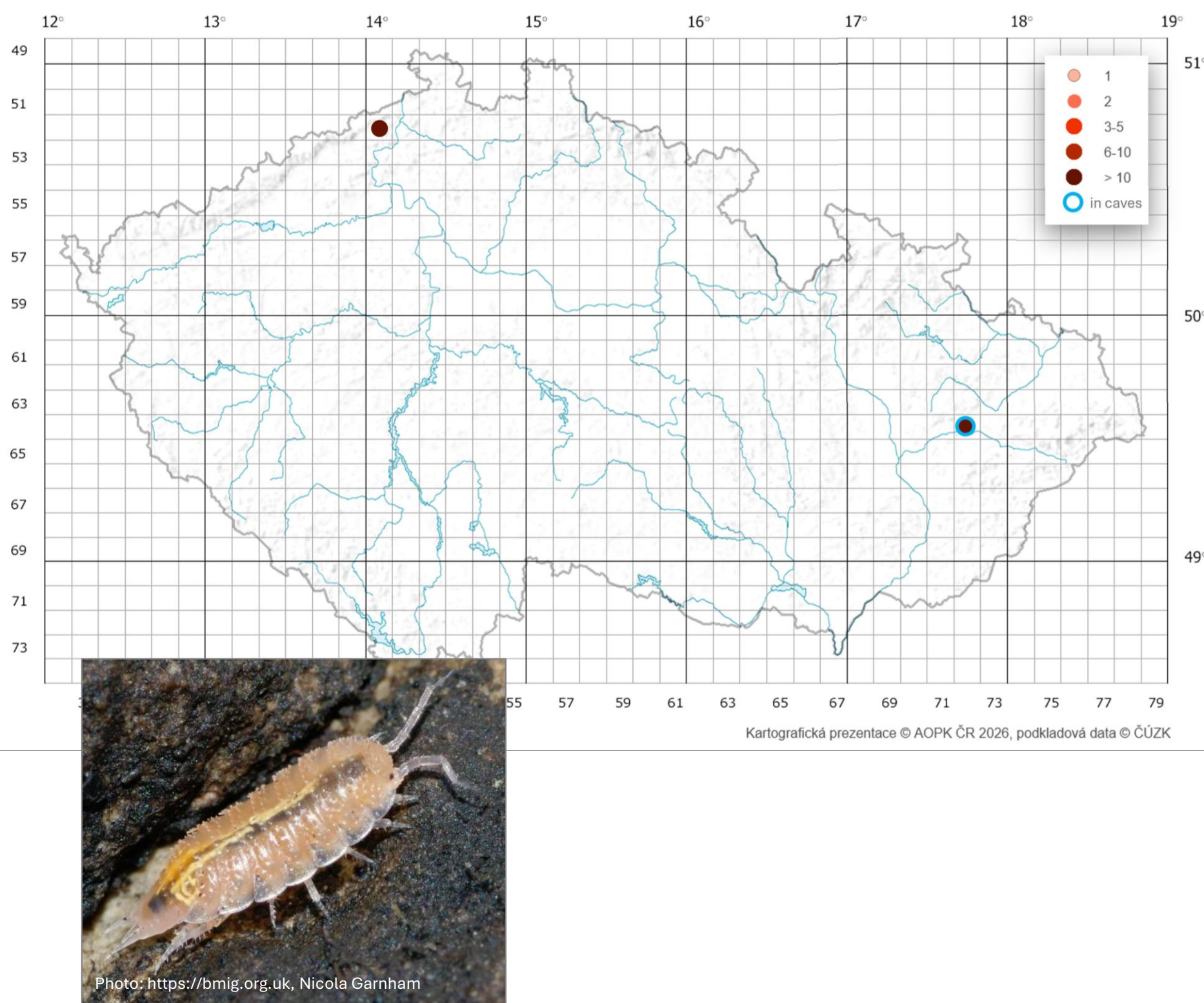


Figure 4 – *Androniscus dentiger* – apart from historical finds in greenhouses in the 1960s, its only occurrence with a permanent population are the Zbrašov Aragonite Caves.

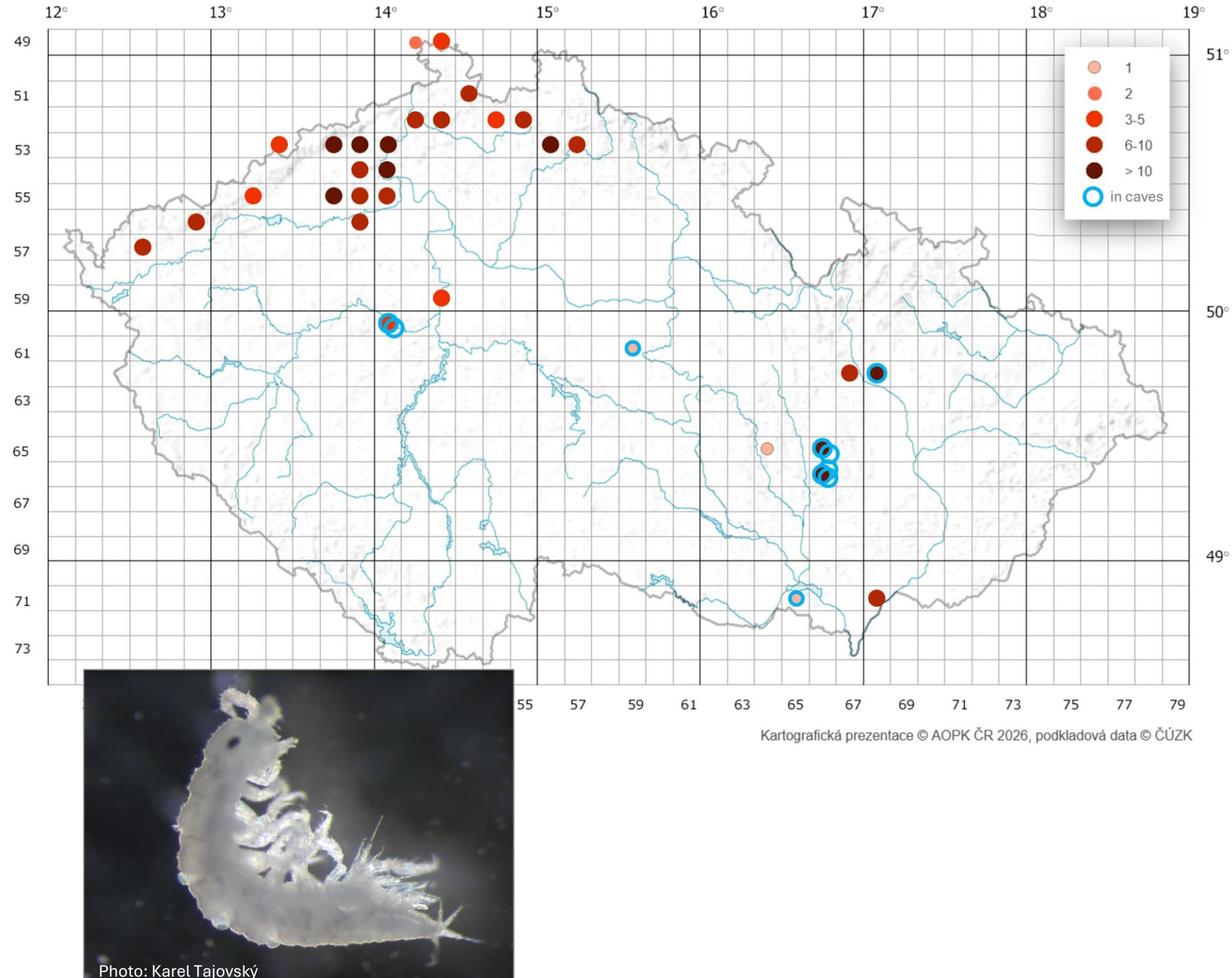


Figure 7 – *Trichoniscus pygmaeus*, recorded repeatedly in the soils of surface sites, lives in caves in all major karst areas of the Czech Republic.

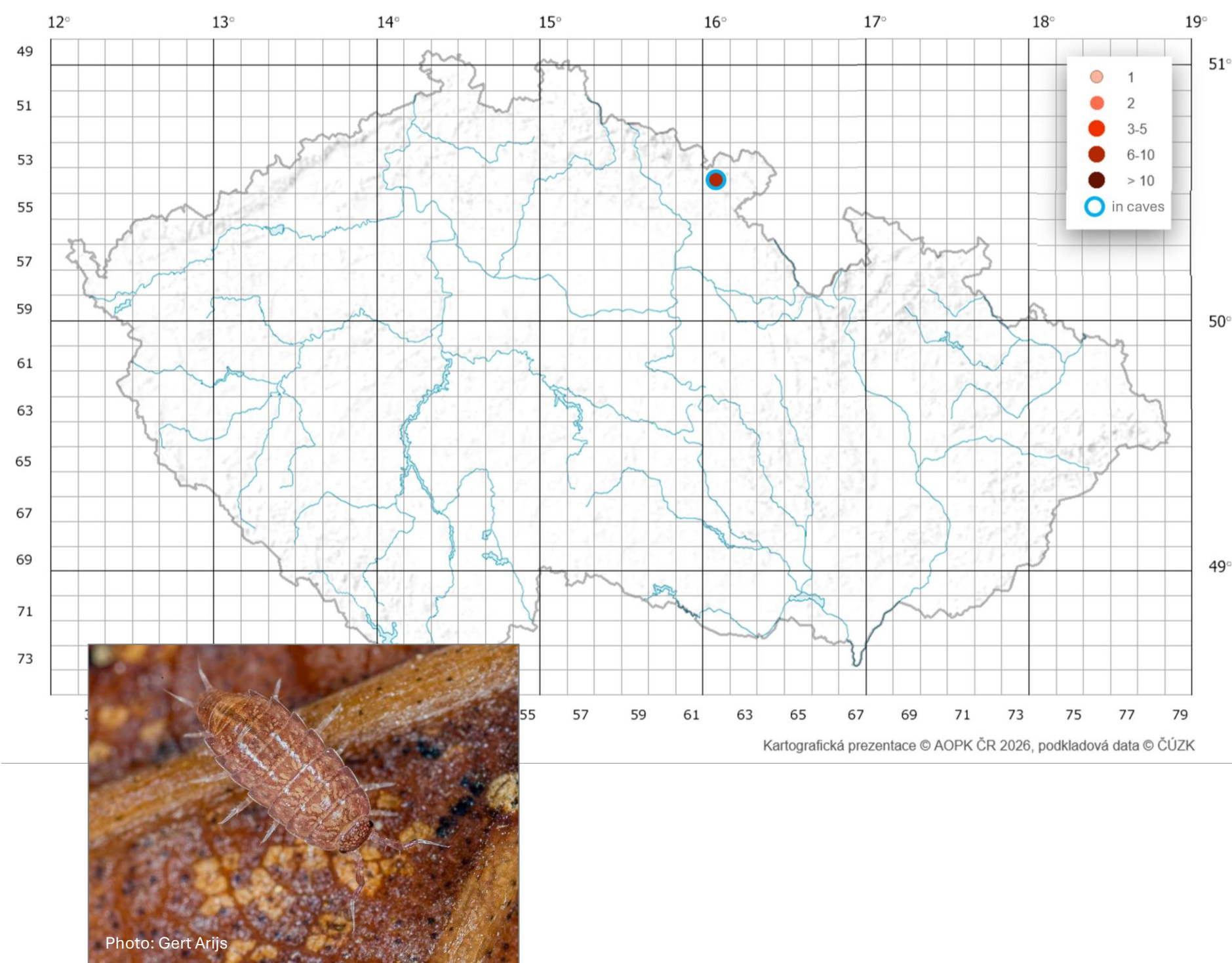


Figure 8 – *Trichoniscus alemannicus* was confirmed for the first time for the territory of the Czech Republic in a small non-karst cave in the sandstone area of the Teplice Rocks.

Acknowledgement

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