

Distribution of *Triturus cristatus* group in the Slovak Republic

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Summary

We are concerned with the research of the distribution of the two species of newts *Triturus cristatus* and *Triturus dobrogicus*, occurring in the area of Slovakia. We've put together available historical data, published records and carried out our own field research. The aims were to find some new localities, verify unclear data, investigate the areas of overlapping populations of both species, as well as survey the hypsometric distribution of these species. Distribution of the species is presented on a grid map. Absence, occurrence, uninvestigated areas and contact zones of the species are presented on a special map. Altitudinal distribution is presented via two column graphs. The total number of 109 localities was worked off, 42 of them belong to the rarer *Triturus cristatus* and 67 to *T. dobrogicus*.

Key words: Slovakia, distribution, grid map, altitudinal distribution, *Triturus cristatus*, *Triturus dobrogicus*.

Verbreitung der *Triturus cristatus*-Gruppe in der Slowakischen Republik

Zusammenfassung

Wir beschäftigen uns mit der Verbreitung der beiden Kammolcharten *Triturus cristatus* und *Triturus dobrogicus* in der Slowakischen Republik. Wir haben die vorhandenen historischen Daten und publizierten Funde zusammengestellt und eigene Felduntersuchungen durchgeführt. Zielstellung war der Nachweis neuer Fundpunkte, die Prüfung unsicherer Daten, die Untersuchung von Gebieten mit überlappenden Populationen sowie die Darstellung der Höhenverbreitung der beiden Arten. Die Verbreitung der beiden Arten wird als Rasterkarten dargestellt. In einer speziellen Karte werden Gebiete ohne und mit Vorkommen, nicht untersuchte Gebiete sowie Kontaktzonen der beiden Arten präsentiert. Die Höhenverbreitung wird in zwei Balkendiagrammen dargestellt. Insgesamt wurden 109 Fundorte ermittelt. An 42 Fundorten lebt der seltenere *Triturus cristatus* und an 67 Fundorten *T. dobrogicus*.

Schlagwörter: Slowakei, Verbreitung, Rasterkarte, Höhenverbreitung, *Triturus cristatus*, *Triturus dobrogicus*.

Introduction

The article is devoted to two species, which were until 1983 (BUCCI-INNOCENTI et al. 1983) considered to be one, *Triturus cristatus* (*T.c.*). Only a few faunistic data were available from the region of Slovakia and not many authors were able to distinguish the subspecies *T. c. cristatus* (*T.c.c.*) and *T. c. dobrogicus* (*T.c.d.*) before, as well as after that time. Another species *Triturus carnifex*, separated from the *T.c.* group, hasn't been recorded in Slovakia

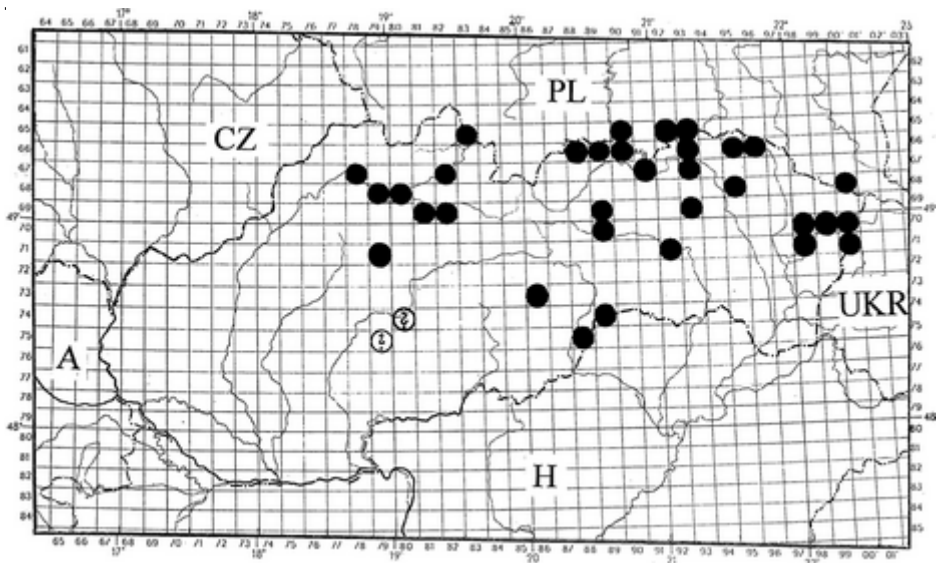


Fig. 1: *Triturus cristatus* (LAURENTI, 1768) grid map of distribution in the Slovak Republic.
 Rasterkarte der Verbreitung von *Triturus cristatus* in der Slowakischen Republik.

yet. Its penetration to this area in future doesn't seem probable, despite its close occurrence along the western frontier in Austria and southern Moravia in Czech Republic (PIÁLEK et al. 2000). First notes about the occurrence of the *T.c.* group came from the authors MERGL (1940), FEJÉRVÁRY-LÁNGH (1943) and ŠTEPÁNEK (1949). The most detailed survey of the occurrence of the subspecies *T.c.c.* and *T.c.d.* published LÁC (1957, 1961, 1968). Many data were obtained from the research of GREGOR (1984, 1985, 1987), KMINIAK (1971), PIÁLEK (1999) and the authors of this article. ZAVADIL's work (1993) emphasizing the hypsometric distribution is very interesting from the faunistic point of view.

Material and Methods

We've collected all available information about the occurrence of both species at the Slovak territory, mainly from museal collections, literature and field notes of several zoologists. Therefore it was necessary to revise many historical records, what, in the case of many destroyed and inaccurately published localities, very often was impossible.

The distribution of both species in Slovakia became more complicated mainly by incorrect historical data of ŠTEPÁNEK (1949), who misinterpreted valuable subspecies of his time. The biggest and the best data sources were the works of LÁC (1957, undated, 1963), who also personally took part in our field research and showed us some localities, described by him, characterized by the occurrence of morphologically intermedial forms. Determination of transitive forms was based on ZAVADIL's morphological measurements, as well as on results of PIÁLEK (in prep.), who determined individuals according to biochemical analysis (ELFO). Main criteria for the determination were the taxonomical, genetical and

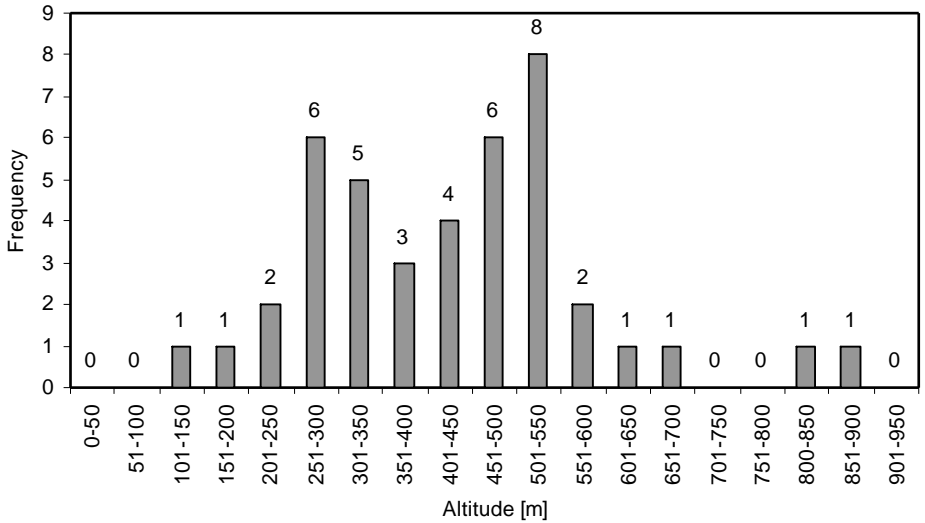


Fig. 2: Occurrence frequency of *Triturus cristatus* according to altitude - The lowest point in Slovakia (94,3 m).

Häufigkeit von *Triturus cristatus* in Abhängigkeit von der Höhenlage. Der niedrigste Punkt der Slowakei liegt bei 94,3 m.

morphological works about *T.c.* superspecies by ARNTZEN & WALLIS (1994, 1999). The distribution of both species was evaluated at grid maps (fig. 1 and 3) and a map of the areas of both species and their overlapping territories was made, too (fig. 5). The occurrence of both species from the hypsometric point of view was worked out at the graphs of the altitudinal distribution (fig. 2 and 4).

Results

Triturus cristatus

T.c. occurs in mountain valleys and lower mountains of central and eastern Slovakia (fig. 1). A few years ago it was known only from some localities now mostly destroyed. The small number of localities results mainly from the small number of suitable habitats for this species at the large area of Turiec, Orava, Liptov, Spiš and the eastern part of Slovenské Rudohorie (TC1) (fig. 5). *T.c.* is rare in these regions and its populations are isolated and therefore very vulnerable and endangered. The situation is better in the northern part of Eastern Slovakia, from Spišská Magura and Levocské Vrchy along the Polish frontier to the Bukovské vrchy and Vihorlat (TC2). Despite the insufficient faunistic research, most of the 42 known localities of Slovakia occur within this area (tab. 1). *T.c.* prefers standing waters at least one meter deep, with many hides between various objects and vegetation. Waters with fish are avoided. The character of the surrounding area during the dry-land phase of its life is of great importance for the occurrence of the species. Frequency at many localities is greatly influenced by the amount of food, food competition and occurrence of

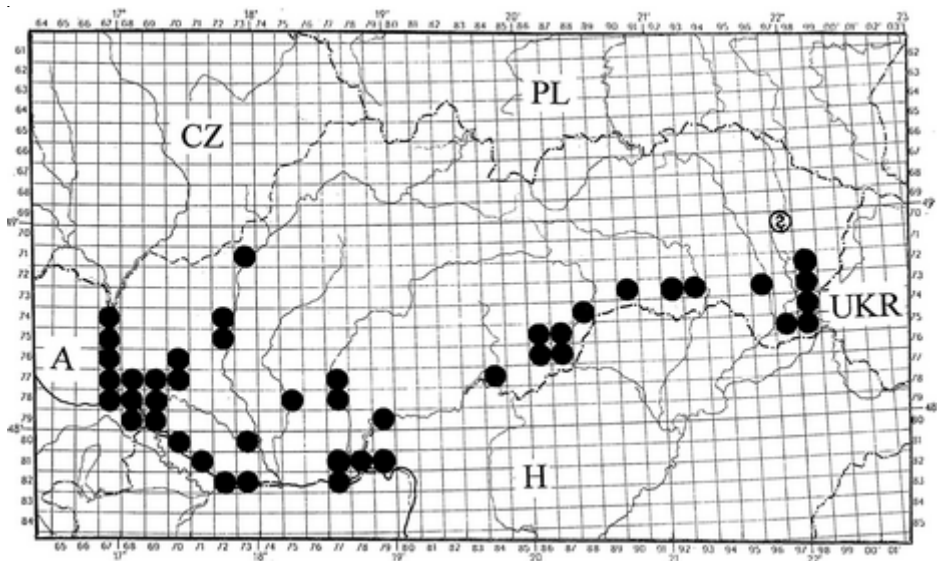


Fig. 3: *Triturus dobrogicus* (KIRITZESCU, 1903) grid map of distribution in the Slovak Republic. Rasterkarte der Verbreitung von *Triturus dobrogicus* in der Slowakischen Republik.

predator species. Most of the Slovak localities was created by the activity of man. These are mainly mining holes, water reservoirs on streams, flooded quarries, dumps and even the holes created by the explosion of army munition. *T.c.* is most frequent at the altitude of 300-600 m above sea level (fig. 2). The lowest locality of its occurrence is at the southern feet of the Vihorlat mountains, in gravel holes near the village Jovsa at the altitude of 115 m (*T.c.* confirmed by electrophoresis - PIÁLEK pers. comm). The highest laying locality is a sewer water basin near the village Torysky at Levocské vrchy at the altitude of 890 m. The southernmost locality is a silted up pond near the Domica cave (48°28' 35" N). Worth to mention is ZAVADIL's observation of *T.c.* in underground waters of the cave, connected with the pond by a small channel. The northernmost locality is Becherov (49°26' 50" N), the easternmost is Ulic (22°25' E) and the westernmost is the historical locality of Žilina (18°44'E).

Triturus dobrogicus

T.d. occurs at the lowlands of Slovakia along the southern frontier with Austria and Hungary, at the northwestern border of the whole area of its distribution (fig. 3). It prefers standing, seldom floating, deeper waters without fish. In fish waters it occurs more frequently than *T.c.*. Around the big rivers of southern Slovakia are relatively enough suitable localities for the occurrence of the species and therefore the density of its occurrence is higher than that of *T.c.*, whereby such a great area as Nitrianska pahorkatina (**TD1**) hasn't been researched in detail and the occurrence of *T.d.* here is very presumable. The greatest density the of so far known localities is at the vicinity of the rivers Morava,

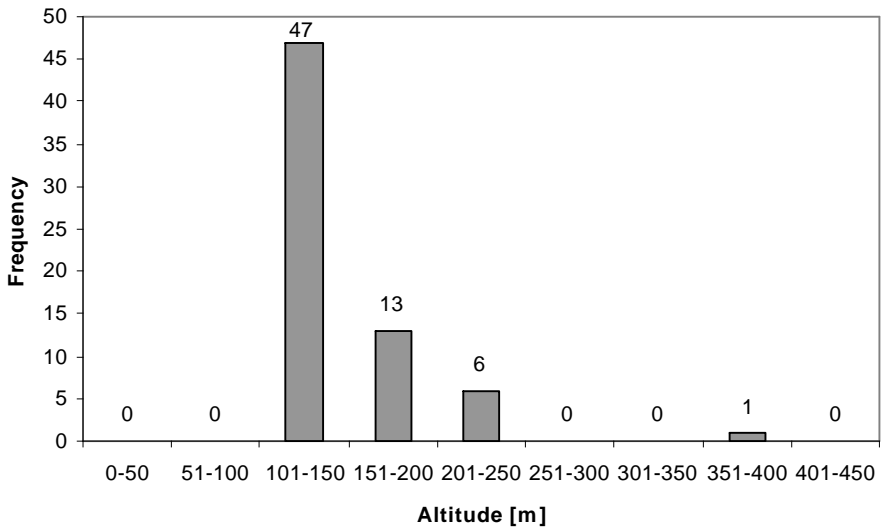


Fig. 3: Occurrence frequency of *Triturus dobrogicus* according to altitude - The lowest point in Slovakia (94,3 m).

Häufigkeit von *Triturus dobrogicus* in Abhängigkeit von der Höhenlage. Der niedrigste Punkt der Slowakei liegt bei 94,3 m.

Danube and Latorica (**TD2**). In spite of this we can consider this species as rare and endangered, mainly by the activities of man, like melioration, dam building and introduction of non native fish species (*Ictalurus nebulosus*, *Ictalurus melas*, *Percottus glenii*, *Lepomis gibbosus*), which are very dangerous predators of all developmental stages of newts. Nearly all the population of *T.d.* at Slovakia occur at the altitude of 100-200 m (fig. 4). Localities at the altitude of 200-250 m we can find only in the region of Slovenský Kras and Rimavská kotlina. One extremely high and single locality at the altitude 400 m is situated at the southern edge of Revúcka vrchovina, at Cierna obora near the village Teplý Vrch.

The lowest localities are at Východoslovenská rovina - Zátinsky luh - 100 m, Leles - 102 m, Botany - 103 m. LÁC's (undated) historical record of the occurrence of *T.d.* from the vicinity of the town Humenné couldn't be verified and so we consider Záblatie near Trenčín (48° 53' 03" N) to be the northernmost locality. The southernmost locality is at Velké Kosihy (47°45' 50" N). The westernmost locality is Bogdalický vrch near Jakubov (16°53' 10" E) and the easternmost is at Veškovce (22° 06' 19" E). 67 localities are now recorded in Slovakia (tab. 2), but we expect, that after a solid faunistic research this number will increase considerably.

Conclusion

Areas of the occurrence of both monitored species at the Slovak territory are easily distinguished, as they are well defined by the altitude and country relief. Known localities

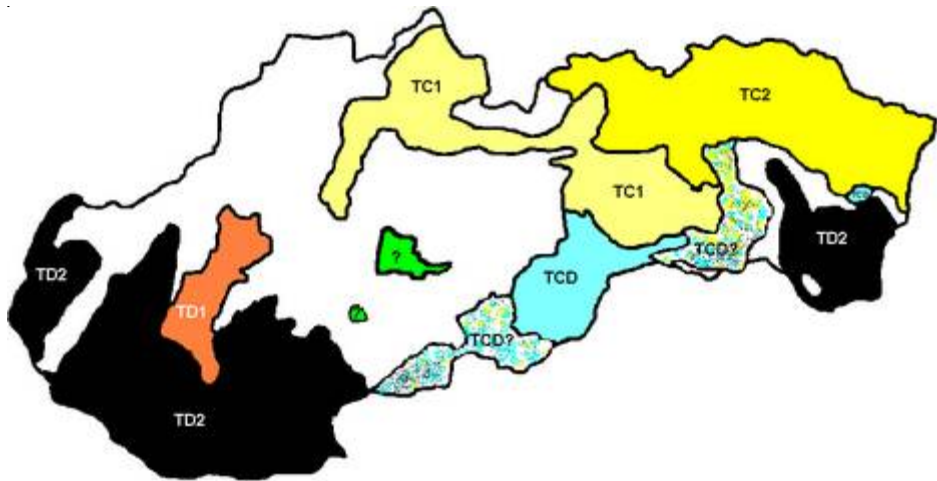


Fig. 5: Distribution of *Triturus cristatus* and *Triturus dobrogicus* in Slovakia. **TC1** – rare occurrence of *T.c.*, **TC2** – territory with frequent occurrence of *T.c.*, **TD1** – territory with probable occurrence of *T.d.*, **TD2** – occurrence of *T.d.*, **TCD** – territory with occurrence of both species, **TCD?** – unresearched territory with probable occurrence of both species, ? – expired historical localities.

Verbreitung von *Triturus cristatus* und *T. dorbgicus* in der Slowakei. **TC1** – seltenes Vorkommen von *T.c.*, **TC2** – Gebiet mit häufigem Vorkommen von *T.c.*, **TD1** – Gebiet mit wahrscheinlichem Vorkommen von *T.d.*, **TD2** – Vorkommen von *T.d.*, **TCD** – Gebiet mit Vorkommm beider Arten, ? – erloschene historische Fundorte.

of *T.c.* are situated mainly at flysch belt of the outer Carpathian arch. The density of these localities is the highest at the northeastern part of the territory. The geomorphological character of northern and northwestern part of the area offers only a few suitable localities and therefore the occurrence of the species here is very endangered. *T.c.* penetrates to inner Carpathians only occasionally, yet. At the eastern part of Slovenské Rudohorie mountains it is making its way up to the southern frontier and through Slovenský Kras mountainsp to Hungary. There it meets the populations of *T.d.*, coming along the valleys and riversides from Hungarian, East- and West-Slovakian lowlands, where the greatest density of populations is known at the bed of big rivers sediments. Contact zones of the distribution areas are found at the region of Slovenský kras mountains, Rimavská kotlina basin, Revúcka vrchovina mountains and souther slopes of Vihorlat mountains (**TCD**) and here also the most extreme hypsometric occurrences were noted. Already in 1957 LAC pointed out the existence of intermedial forms between *T.c.* and *T.d.*, particularly at the regions of Slovenský Kras mountains, Rimavská kotlina basin, Revúcka vrchovina mountains and the now abolished localities from the vicinity of Zvolen. Doom of these localities means, that *T.c.* is extinct now in the whole area of Central Slovakia. The line of contact zones, as seen from the results of the latest research, may extend after a close faunistic examination to the region of Košická kotlina basin, Lucenecká kotlina basin, as

well as Ipelská kotlina basin and Cerová vrchovina mountains (TCD?).

Reliability of the determination is complicated by overlapping values of Wolterstorff's index (WI), which, despite this statement, is still the most reliable method of determination based on morphological characteristics (ARNTZEN & WALLIS 1994; PIÁLEK et al. 1999, 2000). Findings, that WI of individuals at extreme altitudes is frequently overlapping, put forward the idea of monitoring clinal dependence of morphological characteristics on the transition from lowland aquatic forms to terrestrial, mountain forms. This demonstrates also the habitus of individuals from the vicinity of Dómica, Veľký Blh and Teplý vrch, which were undeterminable without biochemical diagnosis. Close faunistic research mainly at contact zones, connected with ELFO methods may bring new information in the future, not only about the distribution of both species, but about their evolution, relationships and hybridization, too. It may also fill the missing data from the Slovak territory in the survey of geographical variability and taxonomy of *T.c.* superspecies (ARNTZEN & WALLIS 1999).

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Appendix

n	Orographic whole	lokalita	date	code	coordinate	alt.	Igt.	det.
1	Beskydské predhorie (mts.)	Kapušany	22.5.1958	6993	49 02 40 N 21 20 E	280	J. Lác	J. Lác
2	Beskydské predhorie (mts.)	Ruský Hrabovec	6.8.1958	7100	48 51 22 N 22 21 08 E	278	J. Lác	J. Lác
3	Bukovské vrchy (mts.)	Ruské,	VIII. 1995	6800	49 06 37 N 22 21 38 E	535	J. Klembara	J. Klembara
4	Bukovské vrchy (mts.)	Ulic	1971	7000	48 58 N 22 25 E	268	MZM Brno	MZM Brno
5	Busov (mts.)	Becherov, valley Riecka	2.8.1998	6593	49 26 50 N 21 17 35 E	550	R. Czefalvay	J. Kautman
6	Busov (mts.)	Cigelka,	14.4.1981	6592	49 24 30 N 21 08 30 E	526	L. Panigaj	L. Panigaj
7	Cergov (mts.)	Hertník, dolina potoka Pastevník	17.4.1983	6793	49 12 30 N 21 12 30 E	500	L. Panigaj	L. Panigaj
8	Cierna hora (mts.)	Margecany	26.5.1958	7192	48 53 30 N 21 00 30 E	330	J. Lác	J. Lác
9	Hornádska kotlina (bas.)	Spišská Nová Ves	1949	7089	48 57 N 20 34 E	470	O. Štepánek	O. Štepánek
10	Košická kotlina (bas.)	Prešov	1956	6993	49 N 21 15 E	250	MZM Brno	MZM Brno
11	Laborecká vrchovina (mts.)	Snina	VI. 1982	7098	48 54 N 22 09 E	216	Š. Pcola	Š. Pcola
12	Laborecká vrchovina (mts.)	Nížňý Komárník, Nat. Res. Komárnická jedlina	31.7.1986	6696	49 22 25 N 21 41 38 E	400	J. Gregor	J. Gregor
13	Levocké vrchy (mts.)	Torysky, Žlabina, 2 km westward from the village Torysky	13.4.1999	6989	49 05 03 N 20 39 16 E	890	J.Kautman V.Zavadil J.Lác	J.Kautman V. Zavadil J.Lác
14	Liptovská kotlina (bas.)	Ružomberok	1954	6981	49 05 N 19 18 E	494	J. Gulicka	J. Gulicka
15	Liptovská kotlina (bas.)	Lisková	IV. 1957	6982	49 05 30 N 19 21 20 E	489	J. Lác	J. Lác
16	Liptovská kotlina (bas.)	Liptovská Teplá	IV. 1957	6882	49 06 N 19 24 10 E	510	J. Lác	J. Lác
17	Lubovnianska	Mníšok nad Popradom vrchovina (mts.)	5.5.1959	6590	49 20 10 N 20 43 05 E	382	J. Lác	J. Lác
18	Malá Fatra (mts.)	Šútovo, flooded quarry	V. 1999	6780	49 09 15 N 19 05 55 E	440	P. Belanský V. Zavadil	P. Belanský V. Zavadil
19	Ondavská vrchovina (mts.)	Bardejov, Hat, gravel holes near the river Topľa	31.7.1998	6693	49 17 50 N 21 14 30 E	300	R. Czefalvay	J. Kautman
20	Ondavská vrchovina (mts.)	Lomné, dam Domaša at the mouth of the river Ondavy	13.4.1978	6895	49 07 N 21 39 E	163	L. Panigaj	L. Panigaj

n	Orographic whole	locality	date	code	coordinate	alt.	lgt.	det.
21	Ondavská vrchovina (mts.)	Svidník, wathrholes near the river Ladomirka, 500 m up above the Svidník	V. 1994	6695	49 19 N 21 24 50 E	225	J. Mizura	J. Mizura
22	Oravská kotlina (bas.)	Zubrohlava, 500 m southward from the village	15.5.1995	6583	49 26 02 N 19 31 09 E	624	J. Kautman P. Belanský V. Zavadil	J. Kautman P. Belanský V. Zavadil
23	Oravská vrchovina (mts.)	Krivá, Mocilá, wetlands near shooting range	15.8.1996	6782	49 17 20 N 19 28 50 E	545	P. Belanský	P. Belanský
24	Podvihorlatska pahorkatina (mts.)	Jovsa, holes 800 m at the left side of the street to Kusín	29.5.1992	7198	48 48 57 N 22 04 56 E	115	V. Zavadil J. Piálek V. Zavadil J. Kautman	V. Zavadil J. Piálek V. Zavadil J. Kautman
25	Revúcka vrchovina (mts.)	Revúca, holes near the street to Revúcka	1999	7386	48 41 40 N 20 07 35 E	320	M. Uhrín	M. Uhrín
26	Slovenský kras (mts.)	Silica, Jaštericie lake	13.4.1999	7489	48 34 07 N 20 32 30 E	590	J. Lác V. Zavadil J. Kautman	J. Piálek
27	Slovenský kras (mts.)	Domica, pond 300 m southwestern from cave	14.4.1999 18.5.1999	7588	48 28 35 N 20 28 07 E	340	V. Zavadil J. Kautman	V. Zavadil J. Kautman
28	Slovenský kras (mts.)	Kecovo	?	7588	48 29 37 N 20 28 40 E	354	J. Lác	J. Lác
29	Spišská Magura (mts.)	Spišská Stará Ves, Majere	1965 – 68	6688	49 18 53 N 20 22 47 E	493	M. Kminiak	M. Kminiak
30	Spišská Magura (mts.)	Cervený Kláštor	V. 1986	6688	49 19 18 N 20 25 E	465	J. Kautman	J. Kautman
31	Spišská Magura (mts.)	Hniezdne	5.5.1959	6689	49 13 15 N 20 37 50 E	539	J. Lác	J. Lác
32	Spišsko-šarišské medzihorie (mts.)	Stará Lubovna	1943	6690	49 13 N 20 41 30 E	548	A. Fejerváry- Lángh	A. Fejerváry- Lángh
33	Spišsko-šarišské medzihorie (mts.)	Plavec, Plavecká strán	2. 8. 1984	6791	49 11 N 20 51 10 E	488	J. Gregor	J. Gregor
34	Štiavnické vrchy (mts.)	Antol, under the village	1974	7579	48 29 N 18 51 30 E	449	J. Lác	J. Lác
35	Turčianska kotlina (bas.)	Cepcín (= Veľký Cepcín)	IV. 1957 25.4.1958	7179	48 53 35 N 18 48 20 E	436	J. Lác	J. Lác
36	Turčianska kotlina (bas.)	Turčianske Teplice	1978	7179	48 52 N 18 51 30 E	520	M. Kminiak	M. Kminiak
37	Turčianska kotlina (bas.)	Vrútky	IV. 1957	6879	49 07 N 18 56 E	382	J. Lác	J. Lác
38	Vihorlatské vrchy (mts.)	Zemplínske Hámre, Vihorlat, Kotlík	VIII. 1983 28.5.1992	7099	48 54 56 N 22 09 41 E	825	J. Gregor J. Haleš J. Piálek V. Zavadil	J. Gregor J. Haleš J. Piálek V. Zavadil
39	Vihorlatské vrchy (mts.)	Valaškovce, southeastern from abandoned village, in deforested part	28.5.1992	7098	48 55 07 N 22 06 47 E	650	J. Piálek, V. Zavadil	J. Piálek V. Zavadil
40	Vihorlatské vrchy (mts.)	Remetské Hámre	1971	7199	48 52 N 22 11 E	276	MZM Brno	MZM Brno
41	Zvolenská kotlina (bas.)	Zvolen	?	7480	48 34 N 19 13 E	292	J. Lác	J. Lác
42	Žilinská kotlina (bas.)	Žilina	25.4.1958	6778	49 14 N 18 44 E	342	J. Lác	J. Lác

Tab. 1: *Triturus cristatus* (LAURENTI, 1768) – table of the occurrence in Slovakia (code - code of grid map, alt. - altitude in m above sea level, lgt - collector, det. - determinant, mts. - mountains, bas. - basin).

Triturus cristatus (LAURENTI, 1768) – Tabelle der Vorkommen in der Slowakischen Republik (code - Koordinate der Rasterkarte, alt. - Höhe in m ü. NN, lgt - Nachweis, det. - Bestimmung, mts. - Berge, bas. - Tal).

n	orographic whole	lokality	date	code	coordinate.	alt.	Igt.	det.
1	Borská nížina (bas.)	Záhorská Bystrica	15.6.1955	7768	48 14 30 N 17 02 30 E	138	J. Lác	J. Lác
2	Borská nížina (bas.)	Moravský Ján, flooded depressions 3 km western from south border village	23.5.1996	7467	48 34 25 N 16 57 35 E	150	J. Kautman	J. Kautman
3	Borská nížina (bas.)	Devínske Jazero, Morava dead arm - Šrek.	2.6.1996 28.5.2000	7767	48 17 25 N 16 57 10 E	141	J. Kautman O. Majzlan	J. Kautman
4	Borská nížina (bas.)	Moravský Ján, Borové,	9.6.1999	7467	48 33 20 N 16 57 03 E	150	J. Kautman	J. Kautman
5	Borská nížina (bas.)	Moravský Ján, Ciglad meadow	11.5.1999	7467	48 33 20 N 16 57 45 E	150	J. Kautman	J. Kautman
6	Borská nížina (bas.)	Jakubov, Bogdalický vrch.	V. 1995	7567	48 24 30 N 16 53 10 E	149	J. Kautman	J. Kautman
7	Borská nížina (bas.)	Vysoká pri Morave,	10.5.1995 12.5.1995 27.5.1995	7667	48 20 39 N 16 53 47 E	144	J. Kautman	J. Kautman
8	Podunajská rovina (low.)	Bratislava - Petržalka	1940 VI. 1956	7868	48 07 N 17 07 E	132	C. Mergl J. Lác	C. Mergl (as T.c.) J. Lác
9	Podunajská rovina (low.)	Bratislava - Petržalka, Danube arm Pecna	1960	7868	48 07 50 N 17 05 30 E	133	F. Szalay	F. Szalay
10	Podunajská rovina (low.)	Bratislava – Petržalka, Malý Druždiak	1960	7868	48 06 05 N 17 07 37 E	132	F. Szalay	F. Szalay
11	Podunajská rovina (low.)	Bratislava – Podunajské Biskupice	7.6.1956	7869	48 08 N 17 12 30 E	133	J. Lác	J. Lác
12	Podunajská rovina (low.)	Bratislava – Pálenisko	IV. 1955	7868	48 08 N 17 09 30 E	135	J. Lác	J. Lác
13	Podunajská rovina (low.)	Šamorín	IV. 1954	7969	48 01 50 N 17 18 20 E	130	J. Lác	J. Lác
14	Podunajská rovina (low.)	Kolárovo	IV. 1956	8073	47 55 N 18 00 E	110	J. Lác	J. Lác
15	Podunajská rovina (low.)	Senec	28.4.1955	7770	48 12 50 N 17 24 25 E	137	J. Lác	J. Lác
16	Podunajská rovina (low.)	Vojka nad Dunajom	2.6.1956	8070	47 58 45 N 17 22 30 E	123	J. Lác	J. Lác
17	Podunajská rovina (low.)	Gabcíkovo	4.8.1954	8171	47 53 N 17 35 E	115	J. Lác	J. Lác
18	Podunajská rovina (low.)	Bratislava - Vajnory (=Dvorník)	1954–1956	7769	48 12 50 N 17 12 30 E	132	J. Lác O.Štepánek	J. Lác
19	Podunajská rovina (low.)	Cicov, near of Danube dead arm Lyon	21.6.1978 28.10.1956	8272	47 46 30 N 17 44 E	113	I. Okáli M.Rybecký J. Lác	J. Kautman J. Lác
20	Podunajská rovina (low.)	Jarovce, gravel holes, western from village	30.4.1990	7968	48 03 20 N	137	J. Moravec J.Moravec	V. Zavadiľ V. Zavadiľ
21	Podunajská rovina (low.)	Bratislava, Petržalka, Chorvátske rameno	19.5.1996	7867	48 07 30 N 17 06 35 E	134	J. Kautman	J. Kautman
22	Podunajská rovina (low.)	Svätý Júr	1940	7769	48 15 N 17 13 E	130	C. Mergl	C. Mergl (as T.c.)
23	Podunajská rovina (low.)	Svätý Júr, Nat. Res. Júrsky Šúr	4.4.2000	7769	48 13 40 N 17 12 47 E	130	R. Czefalvay	J. Kautman
24	Podunajská rovina (low.)	Rusovce, gravel holes north eastern from village	20.5.1996 1.5.1999	7968	48 03 28 N 17 09 20 E	131	J. Kautman	J. Kautman
25	Podunajská rovina (low.)	Bratislava, Podunajské Biskupice, Kópác, Danube arm of Biskupice	1.5.1997	7968	48 05 08 N 17 09 35 E	132	J. Kautman	J. Kautman
26	Podunajská rovina (low.)	Bratislava, Podunajské Biskupice, Kópác, Nat. Res. Dunajské luhy I	22.3.1997	7969	48 04 26 N 17 12 00 E	131	J. Kautman	J. Kautman
27	Podunajská rovina (low.)	Velké Koshihy	17.1.1999	8273	47 45 50 N 17 52 E	109	P. Rác	P.Rác
28	Podunajská rovina (low.)	Cicov, Hámske trstie	V. 1998	8272	47 46 25 N 17 44 50 E	113	J. Kautman	J. Kautman
29	Podunajská rovina (low.)	Calovo (=Velký Meder)	V. 1957	8172	47 51 30 N 17 46 30 E	112	MZM Brno	?
30	Trnavská pahorkatina (mts.)	Modra	1940	7669	48 20 N 17 18 20 E	172	C. Mergl	C. Mergl (as T.c.)

n	orografic whole	lokality	date	code	coordinate.	alt.	lgt.	det.
31	Trnavská pahorkatina (mts.)	Piešťany	28.4.1955	7472	48 35 N 17 50 E	162	J. Lác	J. Lác
32	Trnavská pahorkatina (mts.)	Veľké Kostolany	IV. 1955	7572	48 30 30 N 17 43 30 E	158	J. Lác	J. Lác
33	Trnavská pahorkatina (mts.)	Trnava, Kamenný Mlyn, Trnava ponds	17.9.1981	7671	48 22 03 N 17 32 53 E	150	B.Matoušek	J. Kautman
34	Považské podolie (bas.)	Záblatie pri Trencíne (= Trencín – Záblatie)	12.6.1956	7173	48 53 45 N 19 59 45 E	206	J. Lác	J.Lác
35	Nitrianska pahorkatina (mts.)	Komjatice	17.9.1956	7875	48 09 35 N 18 07 50 E	134	J. Lác	J. Lác
36	Hronská pahorkatina (mts.)	Mužla	19.5.1956	8277	47 47 40 N 18 35 50 E	109	J. Lác	J. Lác
37	Hronská pahorkatina (mts.)	Gbelce, Nat. Res. Parížske mociare	9.5.1975	8177	47 51 45 N 18 30 E	144	Z. Kux	Z. Kux
38	Burda (mts.)	Chlaba, gravel holes	V. 1980	8179	47 49 20 N 18 49 25 E	117	P. Blahník	P. Blahník
39	Hronská pahorkatina (mts.)	Štúrovo	13.9.1956 2.-8.6.1967	8178	47 47 30 N 18 43 E	111	J. Lác Ratajský	J. Lác Ratajský
40	Hronská pahorkatina (mts.)	Tekovské Lužany	18.5.1956	7877	48 06 N 18 32 30 E	185	J. Lác	J. Lác
41	Ipelská pahorkatina (mts.)	Šahy	V. 1956	7979	48 04 20 N 18 57 E	136	J. Lác	J. Lác
42	Ipelská pahorkatina (mts.)	Levice	18.5.1956	7777	48 12 10 N 18 36 40 E	171	J. Lác	J. Lác
43	Lucenská kotlina (bas.)	Rapovce	IV. 1955	7784	48 16 15 N 19 41 15 E	181	J. Lác	J. Lác
44	Revúcka vrchovina (mts.)	Teplý Vrch, Cierna obora	17.5.1999	7586	48 28 30 N 20 08 05 E	400	V. Zavadil J.Kautman J.Piálek	V. Zavadil J. Piálek
45	Rimavská kotlina (bas.)	Šafárikovo (=Tornala)	23.5.1955	7587	48 25 10 N 10 19 35 E	183	J. Lác	J. Lác
46	Rimavská kotlina (bas.)	Jesenské	IV. 1954	7686	48 18 15 N 20 04 20 E	178	J. Lác	J. Lác
47	Rimavská kotlina (bas.)	Rimavská Sec	IV. 1954	7687	48 18 15 N 20 14 05 E	165	J. Lác	J. Lác
48	Rimavská kotlina (bas.)	Rimavská Sobota	VII. 1956	7686	48 23 20 N 20 00 20 E	208	J. Lác	J. Lác
49	Rimavská kotlina (bas.)	Vyšný Blh (= Veľký Blh)	IV. 1956	7586	48 26 55 N 20 06 53 E	195	J. Lác	J. Lác
50	Rimavská kotlina (bas.)	Veľký Blh, pond in park, northern border of the village	16.4.1999 17.5.1999	7586	48 26 55 N 20 06 55 E	216	V.Zavadil J.Kautman J. Lác	V. Zavadil J. Piálek
51	Slovenský kras (mts.)	Hrhov	29.8.1956	7390	48 36 N 20 45 E	205	J. Lác	J. Lác
52	Slovenský kras (mts.)	Plešivec	25.5.1955	7488	48 32 10 N 20 23 55 E	201	J. Lác	J. Lác
53	Košická kotlina (bas.)	Barca pri Košiciach (= Košice – Barca)	29.8.1956	7393	48 40 50 N 21 15 50 E	197	J. Lác	J. Lác
54	Košická kotlina (bas.)	Cana	22.7.1961	7393	48 36 40 N 21 14 10 E	177	Z. Kux Müllerová	Z. Kux Müllerová
55	Košická kotlina (bas.)	Moldava nad Bodvou	11.5.1999	7392	48 36 35 N 21 00 E	216	M. Fulín	M. Fulín
56	Východoslovenská rovina (low.)	Vojcice pri Trebišove	29.8.1956	7396	48 40 30 N 21 43 E	109	J. Lác	J. Lác
57	Východoslovenská rovina (low.)	Kráľovský Chlmec	28.8.1956	7597	48 26 N 21 58 40 E	102	J. Lác	J. Lác
58	Východoslovenská rovina (low.)	Veľké Kapušany	28.8.1956	7498	48 33 15 N 22 04 30 E	104	J. Lác	J. Lác
59	Východoslovenská rovina (low.)	Senné	27.8.1958	7398	48 40 N 22 02 E	107	J. Lác	J. Lác
60	Východoslovenská rovina (low.)	Veľké Kapušany, Latorica	VI. 1954 9.5.1983	7498	48 30 N 22 05 E	100	J. Hanzák I. Zwach	J. Hanzák I. Zwach
61	Východoslovenská rovina (low.)	Veškovce	20. 5.1999 3.4.2000	7498	48 33 15 N 22 06 19 E	105	V. Zavadil J.Kautman J.Piálek	V. Zavadil J.Kautman J.Piálek

n	orographic whole	lokality	date	code	coordinate.	alt.	Igt.	det.
62	Východoslovenská rovina (low.)	Leles, drain canal	23.5.1997 20.5.1999	7598	48 28 35 N 22 01 38 E	102	V.Janský J. Piálek V. Zavadil J. Kautman	J. Kautman V. Zavadil J. Piálek
63	Východoslovenská rovina (low.)	Pavlovce nad Uhom, Ortov	25.6.1987	7498	48 35 N 22 05 40 E	108	P. Blahák	J. Kautman
64	Východoslovenská rovina (low.)	Blatné Remety, Nat. Res. Senné – rybníky (ponds)	V. 1992	7298	48 41 30 N 22 04 01 E	103	J.Piálek V. Zavadil	J. Piálek V. Zavadil
65	Východoslovenská rovina (low.)	Bot any, Nat. Res. Latorický Luh, Dravý Klin	15.4.1999	7598	48 27 50 N 22 06 10 E	103	V. Zavadil J. Kautman J.Lác	V. Zavadil
66	Východoslovenská rovina (low.)	Zatín, Nat. Res. Latorica, Zátinsky luh	21.5.1999	7597	48 29 33 N 21 55 E	100	J.Sabolčíková	J.Sabolčíková
67	Beskydské pohorie (mts.)	Humenné	25.5.1958	7097	48 56 N 21 54 E	167	J. Lác	J. Lác (?)

Tab. 2. *Triturus dobrogicus* (KIRITZESCU, 1903) – table of the occurrence in Slovakia

(code - code of grid map, alt. - altitude in m above sea level, Igt - collector, det. - determinant, mts. - mountains, bas. - basin, low. - lowland).

Triturus dobrogicus (KIRITZESCU, 1903) – Tabelle der Vorkommen in der Slowakischen Republik (code - Koordinate der Rasterkarte, alt. - Höhe in m ü. NN, Igt - Nachweis, det. - Bestimmung, mts. - Berge, bas. - Tal, low. - Flachland).

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