Intraspecific taxonomy and nomenclature of the Danube crested newt, *Triturus dobrogicus*

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Abstract. The Pannonian and Danube Delta populations of *Triturus dobrogicus* are well separated morphologically from each other. We recognize two subspecies of the Danube crested newt. The nominotypic subspecies inhabits the Danube Delta. *Triturus dobrogicus macrosomus* (Boulenger, 1908), comb. and stat. nov., occurs in the remaining part of the species' range.

Introduction

The Danube crested newt has been described as a variety of the crested newt, *Triton cristatus* var. *dobrogicus* Kiritzescu, 1903, from lakes in the environs of Sulina, Tulcea and the Danube River Delta in the northern part of Dobrogea in Romania (Kiritzescu, 1903). However, the name was placed in the synonymy of the nominotypic subspecies of *Triturus cristatus* ("*Triton cristatus* typus" — Schreiber, 1912: 110; "*Molge cristata cristata*" — Nikolsky, 1918: 202). Wolterstorff (1923) created a new subspecies of the crested newt under the name "*Triton cristatus danubialis*". He considered the "forma *dobrogica*" as a local Dobrogean form included in his new subspecies. Nevertheless, Mertens and Müller (1928, 1940) regarded both forms as two different subspecies, *Triturus cristatus dobrogicus* and *T. c. danubialis.* According to these authors, the former subspecies occurs in the Danube Delta, and the latter is distributed over the remaining part of the species' range. Some other authors (e.g., Călinescu, 1931; Fuhn, 1953) did not support this opinion. They believed that both taxa occurred in the Danube Delta. Indeed, Fuhn (1953) recognized three varieties of the subspecies *T. c. danubialis* in Romania, namely: *T. c. danubialis* sensu stricto, *T. c. danubialis* var. *dobrogicus* and new *T. c. danubialis* var. *intermedia.* The two former varieties were sympatric in the Delta, with a preponderance of the first one. Based on the geographic definition of subspecies and the general similarity of *danubialis* and

dobrogicus, some authors synonymized them as *Triturus cristatus dobrogicus* (Fuhn, 1960; Mertens and Wermuth, 1960; Fuhn and Freytag, 1961), a solution that became widely accepted.

The application of biochemical and cytogenetic methods to the systematics of crested newts over the last decades has resulted in the elevation of the subspecies to full species rank (Bucci-Innocenti et al., 1983; Macgregor et al., 1990), and this status was evidenced by data obtained from studies on the contact zones of these taxa (Wallis and Arntzen, 1989; Litvinchuk et al., 1994, 1997, 1999). The new concept of the *T. cristatus* superspecies stimulated re-evaluation of the taxonomic structure of the "new" species. Recently, two subspecies were recognized within *T. carnifex* and *T. karelinii*, respectively (Kalezić et al., 1997; Litvinchuk et al., 1999).

The range of *T. dobrogicus* consists of two parts, restricted to the Pannonian and Dobrogean lowlands, respectively (Arntzen et al., 1997; fig. 1). Based on the small range, relative rarity and rapid loss of habitat, Arntzen et al. (1997) considered the conservation status of *T. dobrogicus* as vulnerable. The species is protected by the Berne Convention (the Annex II) and is included to the 1996 IUCN Red List of Threatened Animals under the category "data deficient" (Oliveira et al., 1997).

The goal of the present paper is to re-evaluate the taxonomic composition of *T. dobrogicus* and its nomenclature.

Materials and methods

We studied the Pannonian *T. dobrogicus* from three Yugoslavian localities, and from eleven localities in the Ukrainian Transcarpathians (= Zakarpatskaya Province). The Dobrogean samples were studied from four Ukrainian localities (Odessa Province) in the Danube Delta (fig. 1). We also studied a Moldavian sample, and a specimen with uncertain origin (the holotype of *Molge macrosoma*).

For morphometric analysis, we used 163 adult specimens of *T. dobrogicus* (tables 1 and 2). The following characteristics were measured with dial callipers (to the nearest 0.1 mm) for each individual: TL is total length; L is body length, from the snout to the front edge of the cloacal split; Lcd is tail length, from the anterior edge of the cloacal split to the tail tip; LiE is distance between fore and hind extremities; Pa and Pp are fore- and hindlimb length, respectively; Lc is head length, from the snout to the border of the mouth angle; Ltc is the head width between the mouth angles. WI is the "Wolterstorff Index", given as ratio between Pa and LiE (in percents). Principal component analysis was performed for both sexes on the standardized residuals of the regression of natural logarithm of size data with SYSTAT 5.0 (Wilkinson, 1989). Discriminant analysis was performed separately for males and females on the natural logarithm of size data with STATISTICA 6.0. Lcd was removed in these analyses because of incompleteness of data.

Figure 1. Distribution of *Triturus dobrogicus*, with localities studied (1 — Ukrainian Transcarpathians: Batevo, Chop, Chornyi Potok, D'yakovo, Dobroselje, Drisina, Gat', Malye Geevtsy, Minai, Mukachevo, Shalanka; 2 — Yugoslavia: Ostrovo; 3 — Yugoslavia: Radoevo; 4 — Yugoslavia: Obetska Bara; 5 — Moldavia: Kagul; 6 — Odessa Province: Reni; 7 — Odessa Province: Izmail; 8 — Odessa Province: Vilkovo, Leski).

Anatomical preparations (dissection, "dry" skeleton, alizarin treatments) and larval external segmentation were used for examination of the number of rib-bearing vertebrae (atlas excluded). Additional information about color and belly spots distribution was studied on animals alive in the field or in captivity, and on preserved specimens (only patterning). The total sample consisted of 320 adults, 21 juvenile and 58 larval specimens.

In 1994-1997, we crossed newts representing various members of the *T. cristatus* superspecies; within *T. dobrogicus*, animals from various parts of the range were also involved. All crosses were carried out at room temperature (20-25°C) in aquaria 60-100 l volume. Eggs deposited on vegetation were collected daily and transferred to shallow bowls where development continued. Larvae were kept in identical conditions and reared in aquaria (20-30 l volume), with density between 10 and 40 larvae per aquarium, depending on the stage of development and the size of animals (exclude larval cannibalism). Embryo and larval survival rates were determined as the number of hatching embryos (beginning active feeding) and metamorphosed juveniles, respectively, in relation to the number of fertilized eggs.

Results

The results of the principal component analysis demonstrated separation of the Danube Delta and Pannonian populations of *T. dobrogicus*. In the two-dimensional plot (fig. 2) we

Table 1. Variation of morphometric characters in males of the Pannonian, Moldavian and Danube Delta samples of *Triturus dobrogicus*. *s* is a standard deviation. The ratio Ltc/L is given in percents.

Character	Transcarpathians[1] ($n = 19$)			Transcarpathians[2] ($n = 17$)			Yugoslavia ($n = 12$)			Moldavia ($n = 2$)	Danube Delta ($n = 49$)		
	Mean	*s*	Range	Mean	*s*	Range	Mean	*s*	Range	Range	Mean	*s*	Range
TL*	117.6	2.9	115.0-120.8	99.0	–	–	–	–	–	–	115.4	8.0	93.5-131.0
L	64.7	4.9	55.4-74.5	61.4	6.0	48.0-70.7	62.7	4.2	53.6-68.7	63.0-64.1	61.1	4.6	51.0-69.0
Lcd*	51.7	2.2	50.0-54.1	45.0	–	–	–	–	–	–	54.1	4.5	41.5-62.0
LiE	38.2	3.8	31.1-47.7	35.5	4.8	24.8-43.8	37.8	3.5	31.9-43.1	35.9-36.8	33.9	3.0	29.2-39.8
Pa	19.4	2.2	14.3-22.5	19.2	1.7	15.7-22.0	18.7	2.4	15.0-23.4	18.6-17.0	20.2	2.2	15.3-25.0
Pp	21.1	1.9	18.0-26.0	20.7	1.8	17.0-24.0	21.0	1.9	18.0-25.0	17.0-18.0	21.6	2.2	16.0-27.0
Lc	6.2	0.5	5.4-7.0	6.3	0.4	5.7-7.4	5.9	0.4	5.3-6.7	5.9-6.2	7.0	0.6	5.8-8.5
Ltc	8.4	0.6	7.2-9.8	8.3	0.8	7.2-10.3	8.2	0.5	7.4-9.0	8.2-8.5	8.9	0.5	7.8-10.0
WI	50.9	3.6	43.0-56.7	54.4	5.0	43.6-64.5	49.6	5.0	43.3-57.1	47.4-50.5	59.6	6.2	47.1-70.5
Ltc/L	13.0	0.8	11.8-14.6	13.6	1.1	11.2-15.2	13.1	0.9	11.6-14.7	13.0-13.3	14.7	1.0	12.3-16.9

[1] Samples collected in the Ukrainian Transcarpathians beyond the contact zone with *T. cristatus* (more than 20 km); [2] samples collected close to the contact zone; * for characters TL and Lcd, the number of specimens examined from Transcarpathians[1] are equal to 3, Transcarpathians[2] is 1, Danube Delta is 48.

Table 2. Variation of morphometric characters in the holotype of *Molge macrosoma* and females of the Pannonian, Moldavian and Danube Delta samples of *Triturus dobrogicus*.

Character	Holotype	Transcarpathians[1] ($n = 11$)			Transcarpathians[2] ($n = 19$)			Yugoslavia ($n = 5$)			Moldavia ($n = 1$)	Danube Delta ($n = 27$)		
		Mean	*s*	Range	Mean	*s*	Range	Mean	*s*	Range		Mean	*s*	Range
TL*	183.9	–	–	–	125.9	6.0	125.0-132.0	–	–	–	–	120.9	14.4	95.0-152.5
L	96.7	74.3	5.9	65.2-83.3	66.4	5.6	54.0-74.9	69.7	6.9	63.2-78.0	65.8	64.5	7.5	52.5-83.1
Lcd*	87.2	–	–	–	56.6	0.9	55.5-57.5	–	–	–	–	56.5	7.1	42.0-71.0
LiE	61.7	46.2	3.4	40.0-52.8	40.7	4.3	31.0-50.0	42.9	5.2	36.0-49.6	40.0	38.0	4.9	29.0-52.3
Pa	26.2	18.0	1.7	15.0-20.0	17.4	1.2	15.0-19.3	17.8	1.6	16.1-20.0	15.0	17.2	2.1	12.2-21.5
Pp	26.0	18.6	1.1	17.0-20.0	18.6	1.7	16.0-21.0	18.6	1.5	17.0-20.0	17.0	18.0	2.2	13.0-23.0
Lc	7.5	6.6	0.5	5.9-7.4	6.4	0.5	5.6-7.6	6.3	0.6	5.8-7.1	6.1	6.9	0.7	5.7-8.0
Ltc	12.1	8.7	0.7	7.5-9.9	8.4	0.5	7.8-9.3	8.4	1.0	7.3-9.4	8.0	9.3	0.9	7.5-11.0
WI	42.5	38.9	2.2	34.9-41.5	43.2	3.3	36.6-50.0	41.8	4.9	37.3-49.7	37.5	45.7	4.9	39.7-60.7
Ltc/L	12.5	11.9	0.6	11.2-13.1	12.8	0.8	11.5-14.4	12.1	1.2	10.9-14.2	12.2	14.4	1.1	12.5-16.4

[1,2] — see designations in the table 1; * for characters TL and Lcd the number of specimens examined from Transcarpathians[2] are equal to 4, Danube Delta is 26.

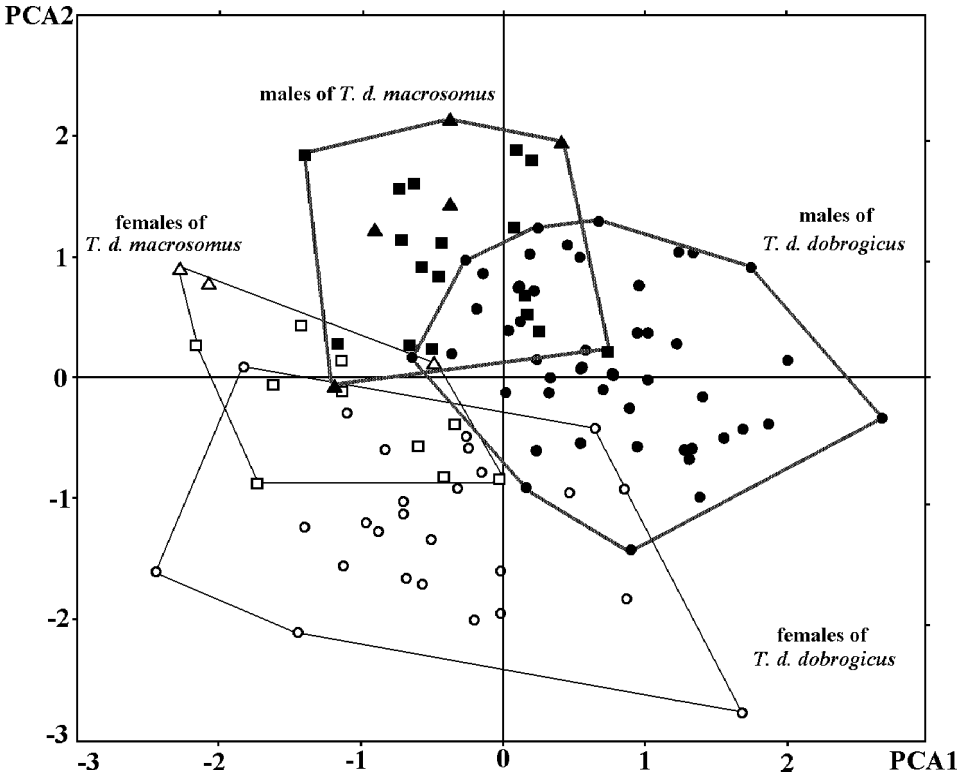

Figure 2. Plot for males (dark figures) and females (open figures) of *T. dobrogicus* from Batevo (squares), Radoevo (triangles) and Vilkovo (circles) in the space of first and second principal component axes (PCA).

show the results of this analysis for Batevo, Radoevo and Vilkovo populations, as most distant from the contact zones with other members of *T. cristatus* superspecies. The first axis has high loadings of all variables, but with contrasting sign (LiE versus the others). It explains 55% of total variance. The second axis, explaining 22% of the total variance, has high loadings of the strongly sexually dimorphic characters — Pa, Pp, Lc and Ltc. The results of the discriminant analysis showed that most specimens from the Pannonian (85.4% for males and 94.3% for females) and Danube Delta (77.6% for males and 96.3% for females) populations are well differentiated from each other. The Moldavian sample and the specimen from an uncertain locality (the holotype of *Molge macrosoma*) are close to the Pannonian populations.

Triturus dobrogicus from the Danube Delta was usually characterized by 16 rib-bearing vertebrae (table 3). On other hand, we noted that the Pannonian populations of the species predominantly have both 16 and 17 rib-bearing vertebrae. Moreover, samples with prevalence of 16 rib-bearing vertebrae were collected only close to the contact zones with

other members of *T. cristatus* superspecies where extensive genetic introgression occurs (see Litvinchuk, 1998; Litvinchuk et al., 1999).

More polished skin, more obvious costal grooves on the body sides and usually bright orange or red belly with small sparse rounded black spots also differentiated the Danube Delta adult animals from the Pannonian ones. In half of the sample from Vilkovo and in 10-20% of the Pannonian samples, the black spots merge on the belly, forming a long dorso-ventral black stripe with uneven edges. Small larvae of *T. dobrogicus* had light (with black spots) or dark coloration. All large larvae (more than 50 mm) of the Danube Delta became deep black, with the exception of gill tips and a stripe in the middle of belly. The Pannonian large larvae usually have a somewhat lighter coloration.

We found that the survival rate of the offspring obtained in crosses between the Pannonian and Danube Delta newts proved to be quite low at embryo stage (table 4). For

Table 3. The number of rib-bearing vertebrae in the holotype of *Molge macrosoma* and in the Pannonian, Moldavian and Danube Delta samples of *T. dobrogicus*.

Locality, country	*n*	Mean	*s*	Number of rib-bearing vertebrae			
				15	16	17	18
Holotype	1	16			1		
Transcarpathians[1], Ukraine	33	16.7	0.5		11	22	
Transcarpathians[2], Ukraine	57	16.4	0.6	2	29	25	1
Ostrovo, Yugoslavia	2	17.0				2	
Radoevo, Yugoslavia	8	16.9	0.4		1	7	
Obetska Bara, Yugoslavia	7	16.0	0.6	1	5	1	
Kagul, Moldavia	3	17.0				3	
Reni, Ukraine	1	16			1		
Vilkovo, Ukraine	30	16.2	0.6	3	19	8	

[1,2] — see designations in the table 1.

Table 4. Embryo and larval survival rates (in percents) in crosses between members of the *Triturus cristatus* superspecies.

Crosses	Localities	Date of egg-laying	Number of fertilited eggs	Embryo survival	Larval survival
dob × dob	Vilkovo(f1) × Vilkovo(m1)	12.01.-17.01.1994	94	28.7	23.4
dob × dob	Vilkovo(f2) × Vilkovo(m1)	19.01.-25.01.1994	24	33.3	33.3
mac × dob	Minai(f1) × Vilkovo(m1)	5.01.-13.02.1994	156	1.9	1.9
dob × mac	Vilkovo(f3,4) × Obetska Bara(m1)	19.09.-23.10.1997	279	13.3	6.8
kar × kar	Adzhi-Su(f1) × Adzhi-Su(m1)	14.06.-14.07.1995	239	42.7	21.3
kar × car	Kutuzovka(f1) × Donja Lokanj(m1)	10.09.-15.09.1997	59	20.3	10.2
car × car	Donja Lokanj(f1) × Donja Lokanj(m1)	11.10.-5.11.1997	102	29.4	15.7
cri × cri	Taitsy (eggs collected in the field)	27.04.-22.05.1999	1223	28.4	–

"dob" is *T. d. dobrogicus* (Odessa Province), "mac" is *T. d. macrosomus* (Ukrainian Transcarpathians and Yugoslavia), "kar" is *T. k. karelinii* (the Crimea), "car" is *T. carnifex macedonicus* (Yugoslavia), "cri" is *T. cristatus* (St. Petersburg Province), "f" is female, "m" is male.

instance, the lowest survival (1.9%) was recorded in the cross of a male *T. dobrogicus* from Vilkovo (Odessa Province) with a female *T. dobrogicus* from Minai (Ukrainian Transcarpathians). The embryos from the crosses between a male from Obetska Bara (Serbia) and two females from Vilkovo showed low survival rates, too (13.3%). In contrast, our observations on the control Vilkovo sample demonstrated that the Vilkovo x Vilkovo crosses provided higher embryo survival rates (28.7-33.3%). It should be mentioned that fifty percent of mortality might be explained by lethal homozygosity on the first chromosome (Macgregor et al., 1990). Interestingly, even the survival rate of the F_1 hybrids obtained from the cross of a female *T. carnifex* and a male *T. karelinii* proved to be higher (20.3%) than that from the Pannonian and Danube Delta samples of *T. dobrogicus* (table 4).

Discussion

The differences in the morphological features and crossing experiments support the idea that the newts from the Danube Delta and Pannonian Lowland should be considered as different taxa at the subspecific or specific level. However, low values of genetical distances (Nei's D = 0.00-0.09) between the samples of *T. dobrogicus* from Odessa Province and Ukrainian Transcarpathians based on allozyme data do not indicate their deep divergence (Litvinchuk et al., 1994; Mezhzherin et al., 1997; Litvinchuk, 1998). We failed to find any significant differences in the genome size (DNA flow cytometry) of these samples (Litvinchuk et al., 1999). Based on our study we have no evidence of sympatry of two forms of *T. dobrogicus* in the Danube Delta. Therefore, taking into account obvious contradictions between various data sets, we incline to recognize two different subspecies of *T. dobrogicus* rather than two different species.

Unlike the Danube Delta subspecies, the nomenclatural status of the Pannonian subspecies is unclear. According to Mertens and Wermuth (1960), the following synonyms have to be considered: *Triton cristatus danubialis* Wolterstorff, 1923; *Triton cristatus danubialis* forma *werneri* Wolterstorff, 1923; *Triton cristatus danubialis* forma *smederewana* Karaman, 1948, and *Triturus cristatus danubialis* var. *intermedia* Fuhn, 1953. The last three infrasubspecific names are unavailable — see 1.3.4. and 45.5. of the International Code of Zoological Nomenclature (Anonymous, 1999). Moreover, an allocation of the name *Triturus cristatus danubialis* var. *intermedia* Fuhn, 1953 based on animals from the Bucharest and Jassy regions should be re-evaluated. Examination of Fuhn's description and illustrations (Fuhn, 1953; figs. 3 and 8) allowed us to assign the variety *intermedia* to *T. cristatus* rather than to *T. dobrogicus.*

Triton cristatus danubialis has been described from the environs of Vienna, Budapest, Pecs (including Fünfkirchen), Brasov (formerly Kronstadt), Bucharest, and the Dobrogea (Wolterstorff, 1923); the type specimens (except Dobrogean ones) were kept at the Magdeburg Museum, Germany (Wolterstorff, 1925). Moreover, Wolterstorff (1923) recognized the samples from Kronstadt and Bucharest as a transitional from *T. c. danubialis* to the

typical subspecies, and the Vienna and Danube Delta samples as the forma *werneri* and forma *dobrogica* within *T. c. danubialis*, respectively (Wolterstorff, 1923). Later, Mertens and Müller (1928) restricted the type territory of *T. c. danubialis* to Budapest. Therefore, the name *danubialis* may be applied as valid to the Pannonian newts.

However, we found a senior name belonging to *T. dobrogicus*. In July 1908, George Boulenger described a new species, *Molge macrosoma*. He had one female presented by Captain Flower to the British Museum. Flower reportedly obtained the animal from Ismail Bey Chakir in Cairo in 1903, but because the Bey bought it from a dealer in Vienna, the newt may be of European origin. Indeed, no salamanders occur in Egypt. According to Boulenger (1908: 33), the new species "is quite distinct from any European newt, being more nearly related to *Molge crocata* (*Neurergus crocatus*, Cope, *Molge strauchi*, Stdr.) from Asia Minor". Later, Thorn (1969: 223) applied the name to the subspecies *T. cristatus carnifex*.

The detailed description and excellent drawing (Boulenger, 1908: plate IV) as well as our examination of the holotype of *Molge macrosoma* allow us to re-identify the newt as *T. dobrogicus*. Indeed, palatine teeth arranged in two parallel series, four fingers and five toes, head shape, laterally compressed tail, and absence of parotoid glands evidence that the specimen belongs to salamandrids and the genus *Triturus*, while warty skin and large body size indicate the *T. cristatus* superspecies. The body proportions (table 2), feebly warty skin, presence of costal grooves and lack of white dots on the sides of the head and trunk allow us to assign it to *T. dobrogicus*.

The large size and black belly seemed to be somewhat strange peculiarities of *Molge macrosoma*. However, our observations on *T. dobrogicus* in the lab showed that in captivity females can reach quite a large size (L up to 91 mm), and that, sometimes, black spots on the belly can extend to cover much of the belly. Only the tips of fingers and toes, cloaca and lower edge of the tail remain orange or yellow; such a coloration pattern ("yellow") is in accord with the original description of *Molge macrosoma*. Moreover, many other authors (e.g., Dürigen, 1897; Schreiber, 1912; Gislén and Kauri, 1959; Arntzen and Teunis, 1993) noted some crested newts with black bellies, too.

The type locality of *Molge macrosoma* is unknown, but, probably, it would be the environs of Vienna where the species is still quite common (Tiedemann, 1990; Thonke et al., 1994). Boulenger's name is older than *Triton cristatus danubialis* Wolterstorff, 1923, and younger than *Triton cristatus* var. *dobrogicus* Kiritzescu, 1903. Hence, as a senior valid name, it should be applied to the Pannonian subspecies of *T. dobrogicus*, and we propose a new combination and a new status, *Triturus dobrogicus macrosomus* (Boulenger, 1908), comb. et stat. nov.

Taxonomic account

Triturus dobrogicus dobrogicus *(Kiritzescu, 1903)*

Triton cristatus var. *dobrogicus* Kiritzescu, 1903: 262. — Terra typica restricta (Mertens and Müller, 1928): lakes in the environs of Sulina, Danube River Delta, Romania.

Lectotype: male, Museum "Gr. Antipa" in Bucharest (MGAB), No 8 (Fuhn and Freytag, 1961).

Paralectotypes: 4 males and 4 females, Museum "Gr. Antipa" in Bucharest (MGAB), No 8 (Fuhn and Freytag, 1961).

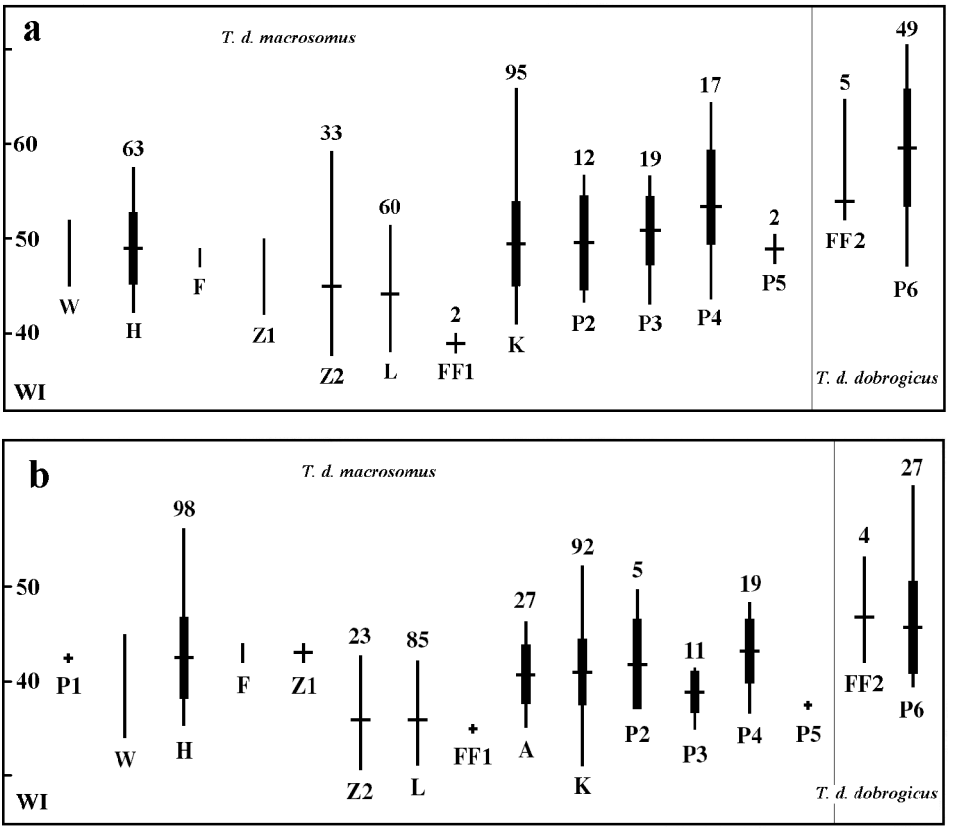

Figure 3. Reported values of the "Wolterstorff Index" (mean + *s* and range) for males (a) and females (b) of *T. dobrogicus*. W — Wolterstorff, 1923 (Austria, Hungary and Romania); H — Herre, 1932 (Austria); F — Fachbach, 1974 (Austria); Z1 — Zavadil et al., 1994 (Austria); Z2 — Zavadil, 1996 (Czech Republic); L — Lác, 1957 (Slovakia); FF1 and FF2 — Fuhn and Freytag, 1961 (Hungary and Romania with types of *T. d. dobrogicus*, respectively); A — Arntzen and Wallis, 1994; K — Kalezić et al., 1990 and 1997 (the former Yugoslavia); P — present paper (1 — the holotype of *Molge macrosoma*; 2 — Yugoslavia; 3 — Ukrainian Transcarpathians, beyond the contact zone (Batevo, Chop); 4 — Ukrainian Transcarpathians, near the contact zone; 5 — Moldavia; 6 — Danube Delta, Ukraine). Sample sizes (if known) are presented at the top of the bars.

Diagnosis: *T. d. dobrogicus* differs from *T. d. macrosomus* by body proportions. The ratio Ltc/L is usually higher than 13.8% for males and 13.3% for females (see tables 1 and 2), and the "Wolterstorff Index" is usually more than 54.0% for males (see table 1; fig. 3). As a rule, the nominotypic subspecies has 16 rib-bearing vertebrae and brighter (almost red) coloration of the belly.

Range: *T. d. dobrogicus* is endemic to the Danube Delta.

Triturus dobrogicus macrosomus *(Boulenger, 1908), comb. et stat. nov.*

Molge macrosoma Boulenger, 1908: 32. — Terra typica: unknown; probably, the environs of Vienna, Austria.

Triton cristatus danubialis Wolterstorff, 1923: 120. — Terra typica restricta (Mertens and Müller, 1928): Budapest, Hungary.

Triton cristatus danubialis forma *werneri* Wolterstorff, 1923: 121 (nomen illegitimum). — Lang-Engersdorf, the environs of Vienna, Austria.

Molge cristata danubialis forma *smederevana* Karaman, 1948: 52; tables 1-7 (nomen illegitimum). — Smederevo, Serbia, Yugoslavia.

Holotype: female, British Museum (BM), No 1946.9.6-29.

Diagnosis: Differs from *T. d. dobrogicus* by the ratio Ltc/L, which is usually less than 13.8% for males and 13.3% for females (see tables 1 and 2), and by the "Wolterstorff Index", which is usually lower than 54.0% for males (see table 1; fig. 3). As a rule, the subspecies has 17 rib-bearing vertebrae and orange or yellow coloration of the belly.

Range: *T. d. macrosomus* inhabits the Pannonian and Vienna basins, as well as an isolated area along the Lower Danube, probably, eastward to Reni (fig. 1).

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