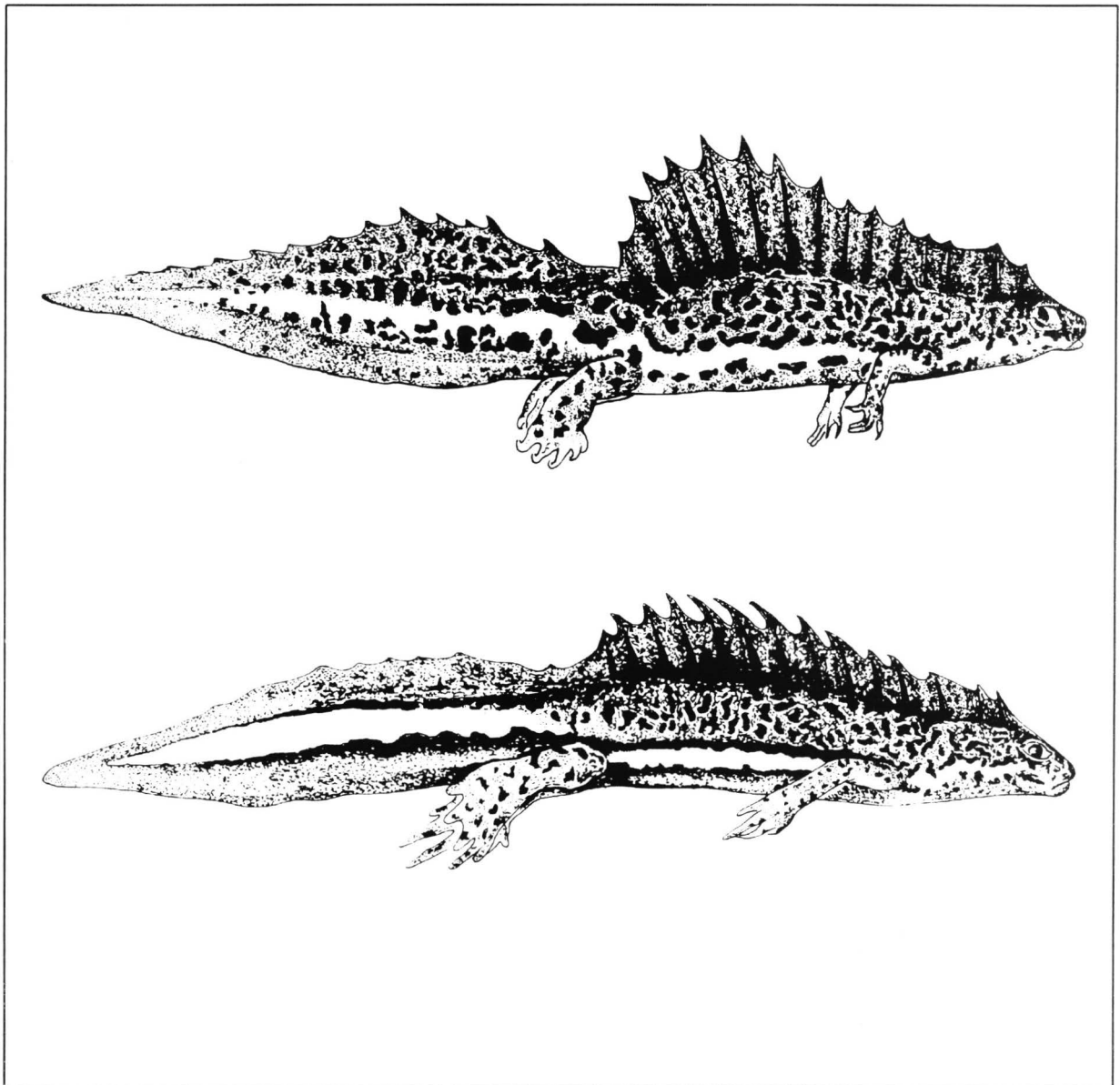


Volume 7, Number 4

October 1997

ISSN 0268-0130

# THE HERPETOLOGICAL JOURNAL



Published by the  
**BRITISH HERPETOLOGICAL SOCIETY**  
*50th Anniversary Year 1947-1997*

Indexed in  
*Current Contents*

## SHORT NOTES

HERPETOLOGICAL JOURNAL, Vol. 7, pp. 169-171 (1997)

### THE TAXONOMIC STATUS OF THE BANDED NEWT (*TRITURUS VITTATUS*) IN SOUTHERN TURKEY

KURTULUS OLGUN<sup>1</sup>, VAROL TOK<sup>2</sup>, J. W. ARNTZEN<sup>3</sup> AND ÖGÜZ TÜRKÖZAN<sup>4</sup>

<sup>1</sup>Adnan Menderes Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 09010 Aydın, Turkey

<sup>2</sup>Ege Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, İzmir, Turkey

<sup>3</sup>School of Biological Sciences, Brambell Building, University of Wales, Bangor LL57 2UW, UK

<sup>4</sup>Dokuz Eylül Üniversitesi, Eğitim Fakültesi, Biyoloji Bölümü, İzmir, Turkey

The range of the banded newt, *Triturus vittatus* (Gray, 1835) falls into two parts. In northern Turkey, the species is distributed along the Black Sea coast from Bursa in the west to Ardahan in the east (Baran & Yilmaz, 1986). The range continues into and across the Caucasus mountains to Stavropol in the north and Telavi in the east (Djanashvili, 1956; Visotin & Tertyshnikov, 1988; Tuniyev, Bakradze & Beregovaya, 1987; Tarkhnishvili, 1996). In southern Turkey, the species is found in the provinces of Icel, Adana, Gaziantep and Hatay (Steinitz, 1965; Schmidtler & Schmidtler, 1967; Atatür, 1974). The southern range continues into Israel as far south as Nahr Rubin (Bodenheimer, 1926) and the easternmost recorded locality is Berisa in Iraq (Kennedy, 1937). Groups of populations are generally attributed to different subspecies: *T. v. ophryticus* in the north and *T. v. vittatus* in the south (Thorn, 1968; Griffiths, 1996). Alternatively, the southern group of populations is subdivided into four or more subspecies: *vittatus* from Syria; *excubitor* Wolterstorff, 1905 from Antakya, Turkey; *cilicensis* Wolterstorff, 1906 from Adana, Turkey; *chuldaensis* Bodenheimer, 1926 from Chuida, Israel and a newly indicated form from Akantu in northern Cyprus. The recorded presence on Cyprus, although accepted by Corbett (1989), probably goes back to an unpublished report by Dr. F. Boglu and H. Hayman (1978), that is of unknown reliability (Schmidtler, 1984; Schaetti & Sigg, 1989). Along with the latter authors, one of us (KO) has been unable to find *T. vittatus* on Cyprus, despite the presence of apparently suitable aquatic habitat for newts.

In a taxonomic revision Steinitz (1965) places *excubitor*, *cilicensis* and *chuldaensis* under *vittatus*, arguing that the diagnostic features used by previous

authors were mere individual variations. This opinion is not shared by Schmidtler & Schmidtler (1967) or Atatür (1974) who, on the basis of newly collected material from southern Anatolia, recognise *T. v. cilicensis* as a separate taxon that is characterized by interrupted dark stripes bordering the silver-grey lateral bands, whereas these stripes are continuous and wider in *T. v. vittatus*. Furthermore, males of *T. v. cilicensis* in breeding condition possess a dorsal crest with a larger number of spikes than the nominate subspecies. We collected material with the aims of describing and testing for morphological differences between the forms.

Thirty-two male and 25 female newts were caught at Ciftlik Köjü near Icel and 20 males and 25 females were caught at Antakya, representing nominal *T. v. cilicensis* and *T. v. vittatus*, respectively (Fig. 1). All were collected in spring 1995 and were in breeding condition. The dark lateral stripes bordering the silver-grey band from fore-leg to hind-leg were scored as either interrupted or uninterrupted. In males the number of spikes in the crest was counted over the length from the snout to the vent, and over the tail. Freshly killed specimens were measured with dial callipers (0.1 mm precision) as follows: snout-vent length (SVL) from the tip of the snout to the anterior end of the cloacal slit, tail length (TL) such that TL equals total length minus SVL, inter-limb length (ILL), head length (HL) from the tip of the snout to the throat-fold and head width (HW) at the widest part of the head. A principal component analysis (PCA) was performed on the standardized residuals of the regression of log-transformed data for each of the variables versus log-transformed SVL, with the software SYSTAT-5 (Wilkinson, 1989). The preserved material is kept in the private collection of K. Olgun.

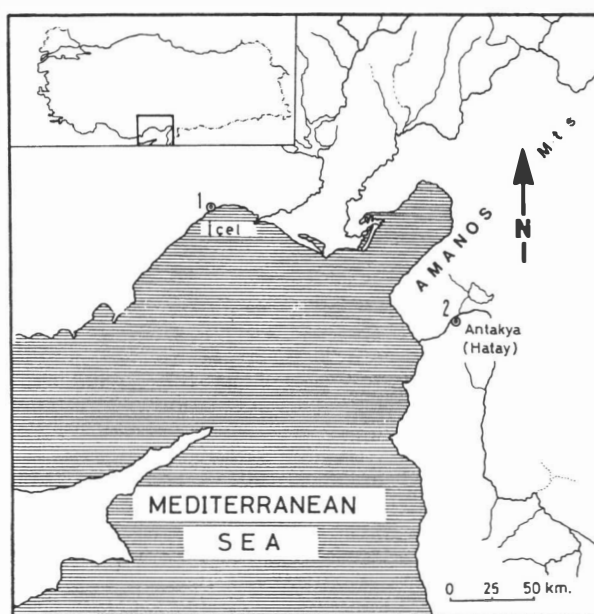


FIG. 1. Localities Icel and Antakya from which specimens of *Triturus vittatus* were studied. The population from Icel is identified as belonging to *T. v. cilicensis* and that from Antakya as belonging to *T. v. vittatus*.

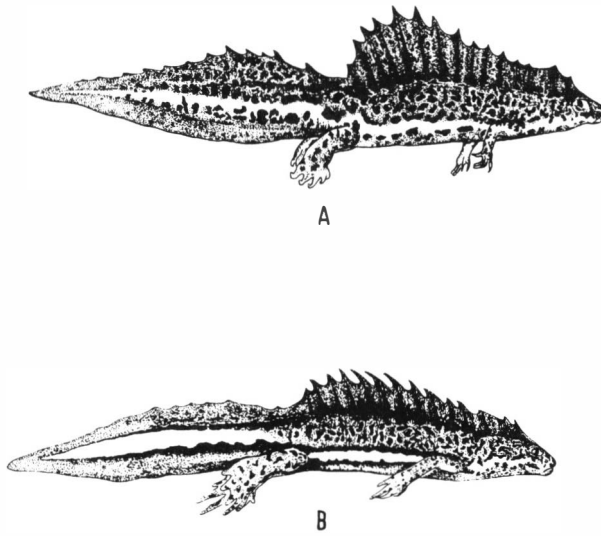


FIG. 2. Typical specimens of *Triturus vittatus cilicensis* from Icel (A) and *T. v. vittatus* from Antakya (B). The male from Icel has 15 crest spikes over the snout-vent length and several, more or less pronounced spikes in the tail crest. The upper and the lower dark stripes bordering the lateral silver-grey band are both interrupted. The male from Antakya has 14 crest spikes while the tail crest is smooth with almost no spikes. The dark lateral stripes are both uninterrupted.

TABLE 1. Results of principal component analysis of the morphometric data.

	Icel		Antakya	
	32 males, 25 females		20 males, 25 females	
	1st axis	2nd axis	1st axis	2nd axis
<i>Males</i>				
mean	0.54	-0.17	-0.25	0.49
SD	0.743	0.801	1.162	2.169
min.	-1.51	-1.91	-1.28	-0.84
max.	1.82	1.32	0.88	2.86
<i>Females</i>				
mean	-0.28	-0.50	-0.21	0.32
SD	1.902	2.467	1.209	1.845
min.	-3.03	-2.25	-1.90	-1.75
max.	1.85	1.14	1.05	2.07

In male newts from Icel the dorsal crest had 14 or 15 spikes as counted over the snout-vent, while fewer but clearly distinct spikes were observed over the tail. In the population from Antakya the number of spikes in the crest over the snout-vent was 13 or 14, while spikes over the tail were few and less pronounced or almost absent (Fig. 2). Variation was also observed between

TABLE 2. Morphological data for eight external characters in *Triturus vittatus* from Icel and Antakya. Morphometric data include mean, standard deviation, and range in mm. The indices [character] / SVL are shown for comparative purposes. For abbreviations used see text.

Population		SVL	TL	ILL	HL	HW	no. spikes in crest	upper stripe interrupted	lower stripe interrupted
Icel, males n=32	mean	89.4	47.5	24.2	11.5	8.0	14.7	38%	100%
	SD	9.19	6.06	1.59	1.08	0.63	0.58	-	-
	min.	73.6	38.3	20.7	9.5	6.9	14	-	-
	max.	108.8	61.2	27.5	14.2	9.3	15	-	-
	index	-	0.531	0.271	0.129	0.089	-	-	-
Icel, females n=25	mean	72.9	35.0	22.5	10.4	7.5	-	88%	100%
	SD	5.93	3.59	1.69	0.87	0.60	-	-	-
	min.	62.4	28.2	19.4	8.7	6.1	-	-	-
	max.	85.8	42.7	25.2	11.8	8.5	-	-	-
	index	-	0.480	0.309	0.143	0.103	-	-	-
Antakya, males n=20	mean	88.3	44.1	25.2	11.4	8.1	13.5	0%	35%
	SD	7.66	4.69	2.03	0.78	0.66	0.51	-	-
	min.	76.3	36.6	22.9	9.9	7.6	13	-	-
	max.	108.5	55.6	30.9	12.9	10.5	14	-	-
	index	-	0.499	0.285	0.129	0.092	-	-	-
Antakya, females n=25	mean	78.4	37.8	24.1	10.6	8.1	-	0%	20%
	SD	7.99	4.56	2.26	0.99	0.72	-	-	-
	min.	64.4	30.3	20.3	9.3	6.7	-	-	-
	max.	93.0	45.4	27.8	12.3	9.2	-	-	-
	index	-	0.482	0.307	0.135	0.104	-	-	-

populations in the frequency with which the lateral stripes were interrupted. The upper stripe was interrupted in 34 specimens out of 57 (60 %) from Icel while the lower stripe was interrupted in all specimens. The upper stripe was uninterrupted in all specimens from Antakya while the lower stripe was uninterrupted in 33 specimens out of 45 (73 %). A principal component analysis on the data that are summarized in Table 1 indicated that morphometric variability within the Icel and Hatay populations largely exceeded inter-population variability. Similarly, no consistent morphometric differences were found between males and females (Table 2).

The results of the present study confirm the notion that in the banded newt from southern Turkey two different forms can be recognized (Schmidtler & Schmidtler, 1967; Atatür, 1974). One form typically has 14 or more spikes in the male dorsal crest and has a discontinuous lower lateral stripe while the upper lateral stripe may also be interrupted. The other form typically has 14 or fewer spikes in the crest and has a continuous upper lateral stripe while the lower lateral stripe may also be uninterrupted. The first form is found in Icel and conforms to *T. v. cilicensis*. The second form was found in Antakya and conforms to *T. v. vittatus*. No consistent morphometric differences were observed between the forms. Populations from many more localities will have to be investigated in order to document the geographical distribution of the two subspecies. The available data suggest that the two forms may be geographically separated by the Amanos mountains (Fig. 1).

## REFERENCES

- Atatür, M. K. (1974). Morphological and taxonomical investigations on *Triturus vittatus* (Salamandridae) populations in southern Anatolia. *Scientific Reports Faculty Science, Ege University* no. 188, 1-22, Izmir (in Turkish with English summary).
- Baran, I. & Yilmaz, I. (1986). On the distribution of *Triturus vittatus ophryticus* in northern Anatolia. In: *Zoology in the Middle East*. Volume 1, pp. 105-107. R. Kinzelbach & M. Kasperek (eds). Kasperek Verlag, Heidelberg.
- Bodenheimer, F. S. (1926). *Triton vittatus chuldaensis* n. subsp. aus Palastina. *Arch. Naturgesch. Berlin* 91, 7679.
- Boglu, F. & Hayman, H. (1978). *Aufstellung der lebenden urodelen in der Turkey*. Typescript pp. 1-8, October 1978, translated by the [sic] 'Göthe Institut, Ankara'.
- Corbett K. (ed.) (1989). *Conservation of European reptiles and amphibians*. Christopher Helm, London.
- Djanashvili, A. G. (1956). *Guide to the amphibians of Georgia*. Tbilisi Univ. Publishers, Tbilisi (in Georgian).
- Griffiths, R. (1996). *Newts and salamanders of Europe*. Poyser, London.
- Kennedy, W. P. (1937). Some additions to the fauna of Iraq. *J. Bombay Nat. Hist. Soc.* 39, 745-749.
- Schaetti, B. & Sigg, H. (1989). Die Herpetofauna der Insel Zypern, Teil 1: Die Herpetologische Erforschung/ Amphibien. *Herpetofauna* 11, 9-18.
- Schmidtler, J. F. (1984). Zur Bestandsituation der Amphibien und hydrophilen Reptilien auf der Insel Zypern. *Salamandra* 20, 43-49.
- Schmidtler J. J. & Schmidtler, J. F. (1967). Über die Verbreitung der Molchgattung *Triturus* in Kleinasien. *Salamandra* 3, 15-36.
- Steinitz, H. (1965). *Triturus vittatus* (Jenyns), geographic distribution and taxonomic subdivision. *Israel J Zool.* 14, 234-240.
- Tarkhnishvili, D. N. (1996). The distribution and ecology of the amphibians of Georgia and the Caucasus: a biogeographical analysis. *Zeitschrift Feldherpetol.* 3, 167-196.
- Thorn, R. (1968). *Les salamandres d'Europe, d'Asie et d'Afrique du Nord*. Lechevalier, Paris.
- Tuniyev, B. S., Bakradze, M. A. & Beregovaya, S. Y. (1987). On the distribution and ecology of the banded newt, *Triturus vittatus* (Jenyns, 1835). *Proc. Zool. Inst., Leningrad* 158, 161-169 (in Russian).
- Visotin, A. G. & Tertyshnikov, M. F. (1988). Amphibians of Stavropol district. In: *Animals of northern Caucasus and adjacent territories*, pp. 87-121. Tertishnikov, M. V. (ed.). Pedagogical Institute Publishers, Stavropol (in Russian).
- Wilkinson, L. (1989). *SYSTAT: The system for statistics*. Computer programme. SYSTAT Inc., Evanston, Illinois.

Accepted: 20.3.97