

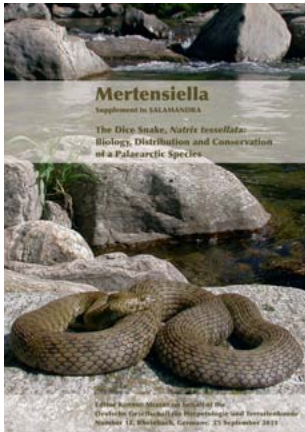
# The Dice Snake, *Natrix tessellata*: Biology, Distribution and Conservation of a Palearctic Species

Konrad Mebert, Editor

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Occasionally we are sent a book which seems sufficiently important, and likely to be of interest to a wide variety of Bulletin readers, that we consider it appropriate to ask more than one person to review it, so that a wider range of views from the herpetological spectrum is represented. This volume is one of them.

Roger Meek, Roger Avery, Editors.



From time to time the journal *Salamandra*, published by Deutsche Gesellschaft für Herpetologie und Terrarienkunde, has supplements which are produced as *Mertensiella*. This book is volume 18. It is devoted entirely to one species, the Dice Snake. It's a large volume, with 469 pages, a lot of good quality illustrations, an attached DVD, more than 130 authors, 47 major articles and 10 "Photo Notes" (which are equivalent to

Short Notes in this *Bulletin*). Even as little as a generation ago, a herpetologist would have been astonished that such a thing was possible: it's an indication of how rapidly the study of reptiles and amphibians has grown.

Dice snakes have a wide geographical distribution, from Switzerland to China, and are clearly an adaptable and successful species (although they are vulnerable at the edges of their range, especially in north-west Europe). The emphasis in this volume, as the title suggests, is on distribution, ecology and conservation, and almost the whole of the species' range is covered: most of the papers relate to Europe, but there are also contributions about these snakes in Russia, Caucasia, Turkey, Jordan, Egypt, Iran and China. Forty-four of the papers are in English, three are in German. Inevitably the scope of individual articles is varied, but all seem to me to be very worthwhile and I wish that I had space to mention them all.

The first paper "sets the scene": a masterly review of the contribution of molecular studies to the phylogenetic history of the species by Daniela Guicking & Ulrich Joger. *Natrix tessellata* probably appeared in south-west Asia in the Miocene, and radiated at about the time of the Miocene-Pliocene boundary. In spite of its current widespread geographical distribution, the species has relatively low geographic differentiation. My hypothetical herpetologist of a generation ago would have been amazed at just how much information about the history of a species and the details of its evolution can be provided by studies of mitochondrial DNA (on which most of the argument is based) and similar molecular techniques.

Two further papers are fairly general in scope: on geographical variation in morphological characters by Konrad Mebert, and on head morphology and diet by Jonathan Brecko et al. From this point onwards, the order of articles becomes broadly geographical. Four papers investigate the ecological relationships between Dice Snakes and their closest relatives *N. natrix* and *N. maura*. A careful study in Italy (Stefano Scali, "Ecological comparisons of the dice snake...and the viperine snake... in northern Italy") shows that the species rarely occur in exactly the same habitats, but that where they do, diet, the detailed aquatic habitat used for hunting and details of the diel cycle of activity are more important than thermal niches - body temperatures are identical. Similarly, in Croatia, dice snakes and grass snakes (*N. natrix*) occupy slightly different aquatic habitats and have slightly different - but overlapping - diets (Bilanja Janev Hutinec & Konrad Mebert, "Ecological partitioning between dice snakes... and grass snakes...in southern Croatia"). Both of these papers, and several others, emphasize that dice snakes feed exclusively on fish.

There are two papers which attempt a more holistic approach: "Dietary, thermal and reproductive ecology of *N. tessellata* in Central Italy: a synthesis", by Massimo Capula et al, and "Parasitism in the Dice Snake...a literature review" by Andrei Mihalca (as someone who was a professional parasitologist, I can say that this is one of the most comprehensive - and interestingly-written - accounts of the parasites of a reptile species that I have seen. More work is clearly needed in this area of research, for example I am sure that the overall list of ectoparasites will eventually come to more than the one species of mite mentioned here).

The ten "Photo Notes", based around one or more photographs, should also be mentioned. Three of them particularly intrigued me: "Mating aggregations of *N. tessellata*" by Konrad Mebert & Thomas Ott, "Luring a dice snake by wave action in the water - a predatory response to a moving aquatic prey?" by Konrad Mebert & Benny Trapp and "Terrestrial dice snakes: how far from water a semiaquatic snake ventures out?" by Konrad Mebert. My review copy was an electronic one, so I couldn't watch the film on the DVD, but I have no doubt that it achieves the same high standards as the book.

If you have any kind of scientific interest in snakes, you should read this volume. Even better, have a copy on your shelves. It will act as a useful source of reference, and may well provide inspiration, for some while to come.

It will be apparent from the tone of these comments that I have a high opinion of this nicely-produced book. It must have represented a huge amount of labour by Konrad Mebert, the editor. Actually, “must have represented” is the wrong verb. I know it did, because he says so in the six-

The dice snake (*Natrix tessellata*) is a truly palearctic snake naturally occurring across three continents; Europe, Asia and a small part of Africa. Across its epic range, the snake inhabits freshwater channels, rivers, lakes, swamps, brackish lagoons, and even sea water and offshore islands. It has successfully colonized mountain streams up to 2800m, desert oasis and isolated semi-arid areas.

The book is a huge compendium on a single species. Konrad Mebert assembled the leading experts to submit their latest research experience as a series of papers for the Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT). Together more than 120 authors and researchers contributed 57 articles and a DVD, from over 25 countries. Mebert himself confesses in the introduction that the experience of collating the work was somewhat draining! One sympathises, communicating and editing in several languages is a daunting thought for anyone, let alone in scientific glossary.

The books' topics and research are all current, useful and applied. They include aspects about conservation projects, national distributions, new populations, range expansions, population dynamics, ecology, genetics, morphology, radio-telemetry, interspecific competition, inbreeding, hybridization, fossils, parasites, behaviour, hunting, predation and diet - a snake fanatic's dream symposia. To comment on all the chapters would take considerable time, as has reading through the whole book, so instead I am hand picking some of the fascinating snippets that may entice readers to dip into this project.

The phylogeography chapter explains the distribution and origin of mitochondrial clades and identifies the origin of dice snakes to be from SW Asia. I found it particularly interesting too that the morphology of dice snakes varies clinally from west to east. Snakes are known to be gape limited predators and as such dice snake populations with thinner heads seem to prefer a more piscivorous diet and those with a broader heads feed more

page preface. I don't blame him. The preface tells more of the rationale, genesis and editorial problems of this book than is usual. I thought that this was a most refreshing and instructive break with convention.

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prevalently on amphibians. The population chapter was also very interesting and presented findings about isolated populations of dice snakes from Germany.

Consultant ecologists might find the chapter on reintroductions especially useful as it demonstrates the importance of extending watercourses and subsequent re-colonisation by dice snakes across habitat that had been improved for them. Radiotelemetry and spatial study work has also been treated in one chapter. It showed that dice snakes exhibited fairly regular patterns in their diurnal activity. I found that the chapter on radiotelemetry was very open and honest about the successes and difficulties of using the techniques applied. I think that many readers investigating uses of radiotelemetry would benefit from reviewing the work.

Captive breeding has also been explored for the species and a full praise of the successes and limitation of potentially breeding for re-release is discussed including details on disease and mortality of hatchlings. Reading through many of the chapters I was amazed at the sheer breadth of research that had been collated and summarised. Purchasers of this text may be disappointed by occasional grammar and typographical errors but these are few and far between. I was unconcerned by this as the volume of work covered is so interestingly diverse. As far as a monograph for a single species is concerned this work is highly substantial and would make a good model for other workers considering a compendium for other well documented species. I would recommend this text for those interested in understanding natricine snakes as much of the ecology may be relevant to similar species.

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