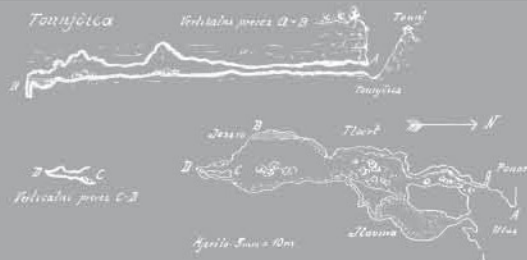


Volume 2

THE CAVE TYPE
LOCALITIES
ATLAS OF CROATIAN FAUNA



HBSD



THE CAVE TYPE LOCALITIES

ATLAS

OF CROATIAN FAUNA

Volume 2

The Cave Type Localities Atlas of Croatian Fauna VOLUME II

Publisher: Croatian Biospeleological Society

Editors: Branko Jalžić, Martina Pavlek

Production editor: Boris Krstinić

Authors:	Branko Jalžić	Fanica Kljaković-Gašpić
	Jana Bedek	Ana Komerički
	Helena Bilandžija	Petra Kutleša
	Petra Bregović	Marko Lukić
	Hrvoje Cvitanović	Marta Malenica
	Tamara Čuković	Kazimir Miculinić
	Anđela Ćukušić	Roman Ozimec
	Tvrtko Dražina	Martina Pavlek
	Lana Đud	Nikolina Raguž
	Sanja Gottstein	Rajko Slapnik
	Dajana Hmura	Vesna Štamol

Reviewers: dr. sc. Nikola Tvrtković, dr. sc. Neven Bočić

English translation: Ana Komerički

Language-editing: dr.sc. Graham McMaster, Lida Lamza,

Graphic design and prepress: Maja Sulić

Cover design: Applaudo grupa, Maja Sulić



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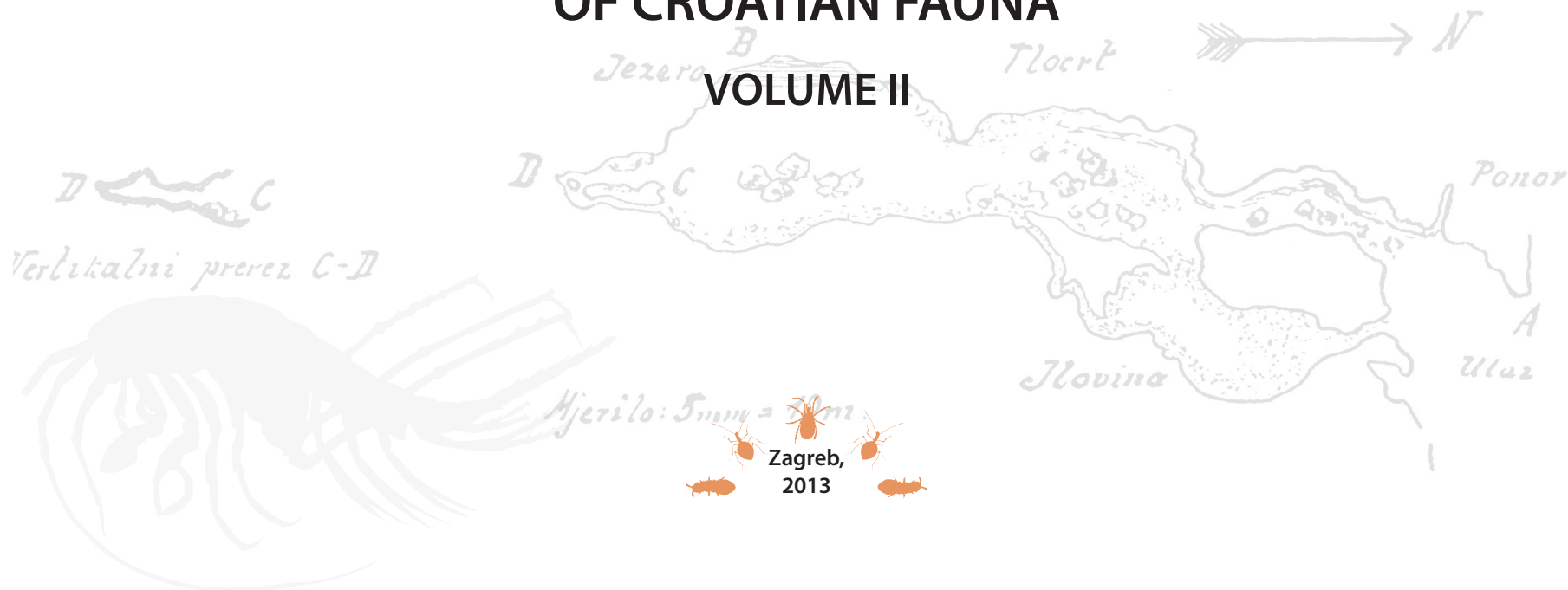
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Branko Jalžić, Jana Bedek, Helena Bilandžija, Petra Bregović, Hrvoje Cvitanović, Tamara Čuković,
Anđela Čukušić, Tvrtko Dražina, Lana Đud, Sanja Gottstein, Dajana Hmura, Fanica Kljaković-Gašpić,
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Martina Pavlek, Nikolina Raguž, Rajko Slapnik, Vesna Štamol

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Zagreb,
2013

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PREFACE

Volume II of the *Cave Type Localities Atlas of Croatian Fauna* (JALŽIĆ *et al.*, 2010) is an upgrade to and a continuation of Volume I. Cave type localities are caves in which a new animal taxon was originally found and consequently described. Croatian Biospeleological Society, in collaboration with the former Ministry of Environmental Protection and Physical Planning, initiated a two-year project entitled “Production of a biospeleology survey, education and popularisation leading to protection of the biosphere of the underground of Croatia” in 2000. One of the project’s most important goals was the formation of a biospeleological *Cadastre*. In 2003 the project was followed up by a three-year programme supported by the same Ministry, which was suspended in 2005 due to the reorganisation of ministries. The project was subsequently financed by the State Institute for Nature Protection. Its most important result was the *Catalogue of Cave Type Localities of Croatian Fauna* (BEDEK *et al.*, 2006), published as a special issue (supplement) of the scientific journal *Natura Croatica* in 2006. The *Catalogue* is the first comprehensive list of all cave type localities in Croatia and all associated taxa. With a total of 206 type localities and 338 taxa, it became apparent that Croatia stands out as a globally significant centre of subterranean fauna biodiversity. These described taxa predominantly include Dinaric endemics (330), the majority of which also represent Croatian endemics (298).

Intensive research by members of Croatian Biospeleological Society and collaborations with numerous explorers, caving organizations and Croatian and foreign scientists resulted in a constant increase in the number of new taxa and type localities. Volume I of the *Atlas* featured a list of 254 type localities and 399 described taxa, with a detailed presentation of 102 localities and 133 taxa. The initiation and launch of the publicly available online database *Biospeologica Dinarica* enabled the expansion of the project domain from gathering data on cave type localities in Croatia to the entire Dinarides. At the moment, the database contains all cave type localities in Croatia as well as 50 localities elsewhere in the Dinarides. Furthermore, it features 684 described taxa, approximately half of the total Dinaric cave taxa. The *Catalogue* and the *Atlas* are first such publications in the world.

In the period between the edition of Volume I and Volume II, the number of cave type localities has risen to 271, and the number of described taxa to 427. Twenty-seven new localities have been added to the list, while ten have been excluded for several reasons: names of taxa from a certain locality were found to be synonyms of names of taxa from other localities (Gotovž jama, Pavšića peća, Špilja kod mlina na Miljacki and Velika špilja kod Goranca); names of two localities were found to be synonyms of other localities (Biba izvor is a synonym of Špilja kod Vrane, Mala špilja na Pelješcu is a synonym of Gorska



jama). Further research showed that one locality is not in Croatia (Špilja u Istri (1)), and that three localities are actually not caves (Izvor u Medveji, Ribnik izvor and Vrelo Gacke). Forty-one new taxa have been added to the list, while thirteen have been excluded. Eight out of 13 excluded taxa were synonymised with other taxa (*Typhlotrechus bilimekii* **clanensis** Depoli, 1938, *Meta milleri* Kratochvil, 1942, *Monolistra pretneri* **spinulosa** Sket, 1965, *Laemostenus schreibersi* **croaticus** Müller, 1951, *Androniscus dentiger* **croaticus** Strouhal, 1939, *Conicera sensilipes* Schmitz, 1938, *Leptomastax croaticus* Csiki, 1913, *Mitostoma olgae* **kratochvili** (Šilhavyi, 1939)). Three taxa are not described from caves (*Bythinella magna* Radoman, 1976; *Jaera nordmanni* **illyrica** Veuille, 1979; *Jaera schellenbergi schellenbergi* Kesselyak, 1938) and two were described from type localities outside Croatia (*Troglohyphantes affinis* (Kulczyński, 1914) and *Troglochthonius doratodactylus* Helversen, 1968). One locality, Velika špilja u Permania, was removed from the list because new research showed that type locality of *Troglohyphantes liburnicus* Caporiacco, 1927 is actually Špilja 468 kod Permana, which was therefore added to the list.

Preparation of Volume II followed the same principles as Volume I, with minor modifications. The *Atlas* starts with the *Content* and *Preface*, followed by a map of 212 type localities in Croatia whose location is known. Of 102 localities presented in Volume I, 90 with known locality are marked in blue; 80 out of 88 localities presented in Volume II are marked in red; while 41 out of 80 remaining localities are marked in black. This is followed by *List of cave type localities of Croatia with described fauna*, which is an alphabetical list of 271 localities with described taxa associated with them. The list contains minor modifications compared to Volume I, which are the result of revision and changes in the names of certain localities, as described above. Unknown type localities have been given a name describing their location (usually the same name used in the paper describing the taxon) in order to distinguish these different, but unknown, type localities. Those names therefore do not represent a valid name for the locality, e.g. Špilja u Lici (1) (Cave in Lika (1)), Špilja u Lici (2) (Cave in Lika (2)), Špilja u Istri (1) (Cave in Istria (1)). The alphabetical list is followed by the *Systematic list of animals described from caves in Croatia*, in which all 427 taxa are organized in corresponding higher taxonomic categories (class, order, etc.). In both these lists, the taxonomic category described from the cave is highlighted in bold; type localities and described fauna thoroughly presented in Volume I are marked in blue; those presented in Volume II in red and all others are written in black.

The lists are followed by detailed presentations of 88 *Selected cave type localities* with 140 attributing taxa. Each cave locality is presented with the following information: a valid cave name, synonyms for the cave (including all other names or location descriptions mentioned in the available literature), descriptions of cave locations, list of described taxa (described taxonomic category: genus, species and/or subspecies written in bold); photograph of the entrance; occasionally also a photograph of the panoramic view of the locality (with the cave entrance marked by an arrow); a map of Croatia with

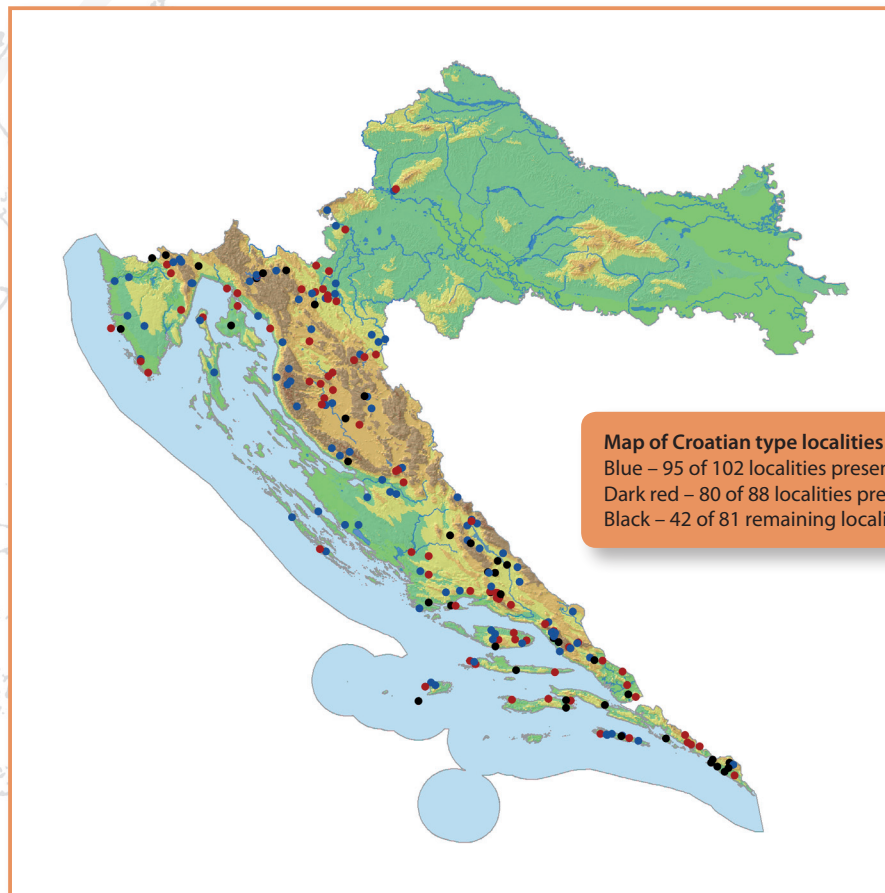
a marked position of the locality; a map of the cave with basic information about it; a photograph (or illustration) of every described taxon; a short text about the cave and its fauna, and finally, a list of references for the locality and type taxa (containing the most relevant reference for the locality if such exists, and all original papers describing the taxa in alphabetical order).

Some of the cave maps were obtained through the exceptional cooperation of many caving organizations in Croatia. Certain maps have been taken from the literature (references are listed in map description) and published either in the exact form as the originals, or with some modifications. Maps of certain caves are incomplete because the speleological surveys are still in progress. There are no maps for 12 caves, either because their underground chambers are too small for cavers to enter, or their exact location is unknown due to insufficient or incorrect description in the original paper. Photographs of most of the animals were taken in the type locality itself. Some animals were photographed in the laboratory, and a few in other, usually nearby localities. The size of each animal, taken from the original description paper or estimated by experts for specific groups, is given beneath its photo. A short text alongside each locality contains the most interesting feature of each locality and its category of protection (if applicable) according to the *Protected Geoheritage of Republic of Croatia* (ZWICKER *et al.*, 2008). The information about animals includes the basic distribution, an interesting feature and, again if applicable, the conservation status according to the *Red Book of Croatian Cave Dwelling Fauna* (OZIMEC *et al.*, 2009).

The *Glossary* provides explanations for some expert or less familiar terms; it is followed by the *Acknowledgements* to all the individuals, societies and institutions whose assistance enabled the completion of this *Atlas*. At the end of *Atlas* are all the *References* listed in alphabetical order.

The first volume of the *Atlas* was very well accepted by the professional and general public, and we hope that the second volume will have similar success. Our intention is to contribute to the recognition of cave habitats and their unique fauna as an exceptionally valuable part of Croatian natural heritage, and thus ensure their conservation. Driven by the aforementioned goal and the large number of cave type localities in Croatia, plans have been made for a third volume that will present the remaining as well as new type localities.

All species listed on Annex I and Annex II of the Ordinance on Proclamation of the Wild Species as Protected and Strictly Protected are strictly protected or protected (OG 99/09).



Map of Croatian type localities with known locations

Blue – 95 of 102 localities presented in Volume I

Dark red – 80 of 88 localities presented in Volume II

Black – 42 of 81 remaining localities

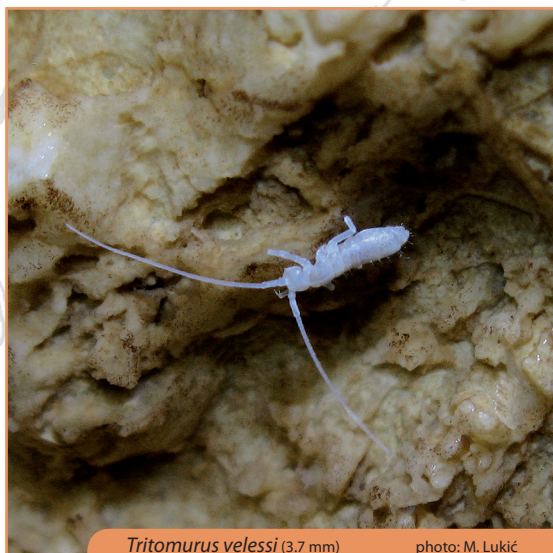


● Amfora

- **Synonym:** Amfora cave
- **Location:** Sv. Jure, Biokovo Mt.
- **Described taxon:** *Tritomurus velessi* Lukić, Houssin & Deharveng, 2010



Location of Amfora



Tritomurus velessi (3.7 mm)

photo: M. Lukić



Tritomurus velessi

photo: C. Houssin

788 metres deep, Amfora is the second deepest cave on Mt. Biokovo. Its narrow passages make it one of the technically most demanding caves on Biokovo and in Croatia. At the depth of 260 m, a constant water flow meanders through narrow passages and creates a specific habitat, cave hygropetric, home of the springtail Scissorhand Veles. At the moment, Amfora is its only locality. Due to its extremely long claws, which earned it the name Scissorhand, Veles is one of only a few springtail species in the world adapted to life on wet rocks.



photo: B. Jalžić

Entrance to Amfora

References:

- LACKOVIĆ D. & BAKŠIĆ, D., 2003: Speleološko istraživanje jame Amfore u 2002. godini. Subterr. Croat. 1, 3-9.
- LUKIĆ, M., HOUSSIN, C. & DEHARVENG, L., 2010: A new relictual and highly troglomorphic species of Tomoceridae (Collembola) from a deep Croatian cave. ZooKeys 69, 1-16.

AMFORA

SV. JURE, BOKOVO MT.

Exploration by: SO PDS Velebit, SAK Ekstrem,
SO HPD Željezničar, SU Spelunka, SD Karlovac,
SO HPD Dubovac, SD Matokit, SD Krstatiće

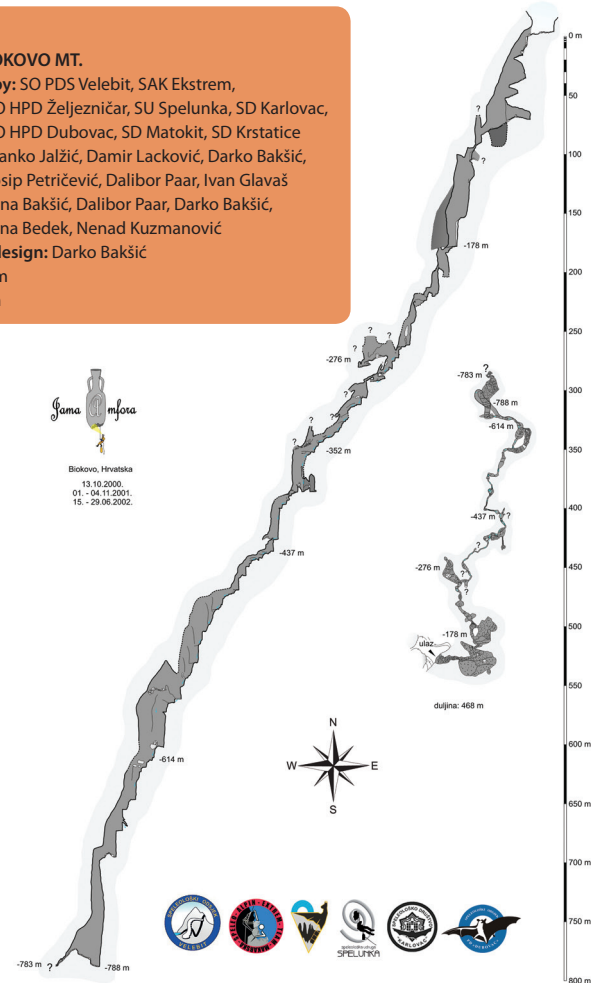
Survey by: Branko Jalžić, Damir Lacković, Darko Bakšić,
Josip Petričević, Dalibor Paar, Ivan Glavaš

Measuring: Ana Bakšić, Dalibor Paar, Darko Bakšić,
Jana Bedek, Nenad Kuzmanović

Editing and design: Darko Bakšić

Length: 468 m

Depth: 788 m



Map of Amfora

from: Lacković, D. & Bakšić, D., 2003.