



Hrvatsko biološko društvo
SOCIETAS BIOLOGORUM CROATICA
Croatian Biological Society

14. HRVATSKI BIOLOŠKI KONGRES
s međunarodnim sudjelovanjem

14th CROATIAN BIOLOGICAL CONGRESS
with International Participation

Pula, 12 - 16. 10. 2022.



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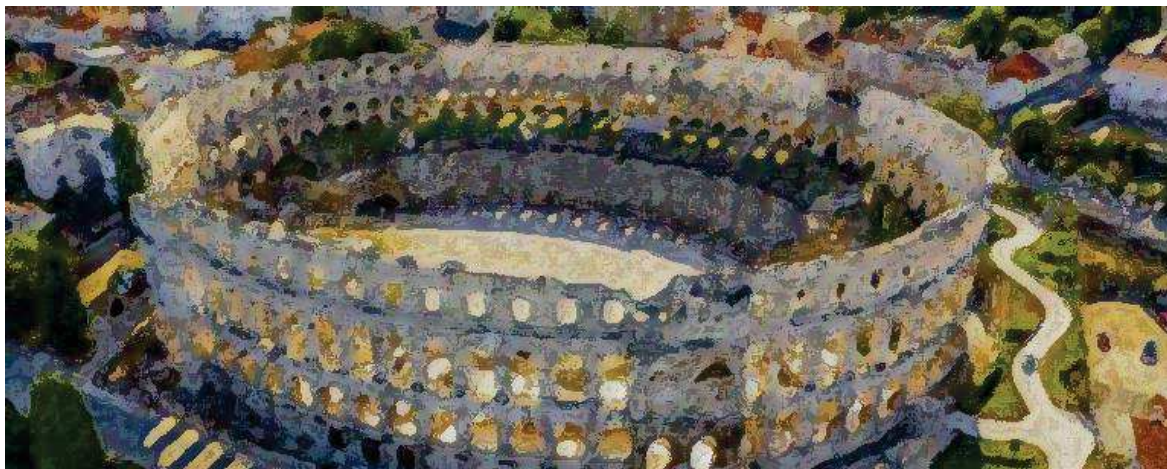
ZBORNIK SAŽETAKA
BOOK OF ABSTRACTS



**14th Croatian Biological
Congress**
Pula, October 12 -16, 2022



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14. HRVATSKOG BIOLOŠKOG KONGRESA**

**BOOK OF ABSTRACTS
OF THE 14th CROATIAN BIOLOGICAL CONGRESS**

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Katarina Caput Mihalić
Vlatka Mičetić Stanković
Inga Urlić
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Hrvatsko biološko društvo
Croatian Biological Society
Rooseveltov trg 6, HR-10000 Zagreb, Hrvatska
Tel: +385 (0)1 4877733; Fax: +385 (0)1 4826260
e-mail: info@hbd-sbc.hr
URL: www.hbd-sbc.hr

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Aegopis and 7 *Vitrina* specimens. Our results indicate the separate position of the genus *Troglaeopis* and unexpectedly *A. verticillus* in relation to the families Zonitidae and Vitrinidae that suggest new systematic position on family level for the genera *Troglaeopis* and *Aegopis*.

Keywords: Gastropoda, Zonitidae, *Troglaeopis mosorensis*, mtDNA, phylogenetic relationship

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GENETIC CHARACTERISTICS OF INTRODUCED MOUFLONS IN CROATIA AND SLOVENIA

E. Bužan¹, F. Urzi¹, B. Pokorny², L. Duniš¹, A. Bončina¹, L. Iacolina^{1,3}, N. Šprem⁴, S. Stipoljev⁴, P. Mereu⁵, G. Leoni⁵, M. Pirastru⁵, T. Safner⁶

¹University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies, Department of Biodiversity, Glagoljaška 8, 6000 Koper, Slovenia, (aja.boncina@famnit.upr.si), ²Faculty of Environmental Protection, Trg mladosti 7, 3320 Velenje, Slovenia, ³Aalborg University, Department of Chemistry and Bioscience, Frederik Bajers Vej 7H, 9220 Aalborg, Denmark, ⁴Faculty of Agriculture, Department of Fisheries, Apiculture, Wildlife Management and Special Zoology, University of Zagreb, Svetošimunska cesta 25, 10000 Zagreb, Croatia, ⁵University of Sassari, Dipartimento di Scienze Biomediche, Via Muroni 25, 07100 Sassari, Italy, ⁶Faculty of Agriculture, Department of Plant Breeding, Genetics and Biometrics, University of Zagreb, Svetošimunska c. 25, 10000, Zagreb, Croatia

In the early 20th century, mouflons were introduced in Croatia, while introductions in Slovenia occurred in the 1950s and 1960s. Since the introduction, populations in both countries have remained stable, with occasional declines and increases in some areas. Our aim was to: i) determine the origin of introduced mouflons, ii) compare the neutral and adaptive genetic make up of introduced populations. We also included individuals from Germany, Corsica, Sardinia, and the Czech Republic in the genetic analysis, which was performed at neutral loci (partial fragment of mitochondrial control region, mtCR) and adaptive major histocompatibility complex (MHC; DRB exon 2) using the next generation approach. The haplotype network based on mtCR showed that most mouflons from Slovenia share the same haplotypes or are closely related to mouflons from Germany and Sardinia; a few share the same haplotypes as most mouflons from Croatia. All Croatian mouflons share the same or close haplotypes as the population from Croatia's Brijuni National Park. Similar results in both countries were revealed by MHC genes. The origin of populations, as indicated by the genetic data, is consistent with written historical data, but also clarifies some evidence for the introduction or release of additional individuals into some colonies for which historical data are not available. We confirmed that both mitochondrial DNA and MHC polymorphism can be used as powerful markers for studying translocation pathways.

Keywords: mouflon, introduction, mtCR, MHC, NGS

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INTEGUMENT IN *Apfelbeckia insculpta* (L. Koch, 1867) (DIPLOPODA, CALLIPODIDA) – MORPHOANATOMICAL AND ULTRASTRUCTURAL STUDY

B. Ilić¹, M. Labudović Borović², B. Dudić¹, J. Milovanović¹, I. Novaković³, L. Lučić¹, S. Makarov¹

¹Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski Trg 16, 11000 Belgrade,

Serbia (bojan.ilic@bio.bg.ac.rs), ²Institute of Histology and Embryology “Aleksandar Đ. Kostić”, Faculty of Medicine, University of Belgrade, Doktora Subotića 8, 11000 Belgrade, Serbia, ³Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia

The morphoanatomical and ultrastructural features of the integument (cuticle + epidermis) of an endemic Balkan millipede, *Apfelbeckia insculpta* (L. Koch, 1867), are investigated utilizing light (LM) and transmission electron microscopy (TEM). Cuticle consists of epicuticle (outermost layer), exocuticle, endocuticle and membranous layer that is in contact with the underlying epidermis. Epicuticle is layer of varying thickness, while exocuticle is composed of helicoidally arranged sheets of microfibriles that appear as close-spaced light and dark bands. Endocuticle is the widest part of cuticle with the broad light bands that are oriented in the same direction. TEM micrographs show that these bands are composed of lamellae arranged in arcuate pattern and curved microfibriles. Membranous layer is intersected in some regions by canals that connect epidermis and different levels of the cuticle and/or surface. The epidermis is monostratified layer of cells that are characterized by distinct polarity. Basal part of epidermal cells is rich in rough endoplasmic reticulum and mitochondria, while apical part contains numerous osmiophilic granules. Nuclei of epidermal cells are ovoid and positioned in different regions of cells. Interdigitations are formed among cells in some epidermal regions. Our study corroborates previous findings on integument organization in Diplopoda and shows that species-specific patterns of cuticular ultrastructure can be present in these arthropods.

Keywords: millipedes, cuticle, epidermis, light microscopy, transmission electron microscopy

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MICROSTRUCTURAL ORGANIZATION OF ADHESIVE PADS IN *Apfelbeckia insculpta* (L. Koch, 1867) (DIPLOPODA, CALLIPODIDA)

B. Ilić, V. Vujić, J. Milovanović, Z. Jovanović, D. Stojanović, V. Tomić, S. Makarov
Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski Trg 16, 11000 Belgrade, Serbia (bojan.ilic@bio.bg.ac.rs)

Males of many millipedes possess a number of secondary sexual characters (SSCs). Probably, the best-known SSCs in millipedes are gonopods, i.e., modified legs of the seventh body ring that are used for sperm transfer. Other SSCs can be found in diplopod males – modifications of gnathochilarium, coxal glands or adhesive pads on walking legs. Although the organization of SSCs has been well documented in diplopods, microstructure of leg adhesive pads is still understudied. The aim of this study was to determine the fine structure of adhesive pads in males of *Apfelbeckia insculpta* (L. Koch, 1867), an endemic species of Western Balkans. Microstructure of adhesive pad was studied using light and scanning electron microscopy. Adhesive pads are developed on all legs, excluding the first three and the last five leg-pairs. They are present on ventral surfaces of tibiae and tarsi, and their surface area is largest on anterior legs. Adhesive pads are formed of numerous filamentous bristles with acuminate tips. Each bristle has round socket on tibial and tarsal surface and shows light striation in upper parts. The tips of bristles on their ventral side are flattened and with horizontal striation that is narrowing toward the bristle tip. As adhesive pads are present only in males of *A. insculpta*, we assume that these structures enable male to achieve firmer grip and to hold onto female during mating.