

ACUTE TOXICITY ASSESSMENT OF DEFENSE SECRETIONS OF *MEGAPHYLLUM BOSNIENSE* (VERHOEFF, 1897) AND *M. UNILINEATUM* (C. L. KOCH, 1838) (DIPLOPODA, JULIDA) ON *ARTEMIA SALINA*

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Introduction

☞ Different chemical compounds can be found in defense secretions of species of the order Julida, with the highest representation of quinone and/or esters.

☞ Numerous biological activities of these secretions are reported: antimicrobial, antioxidative, cytotoxic, antineurodegenerative.

Objectives

☞ To examine the toxic effects of defensive secretions of two species from the order Julida [*Megaphyllum bosniense* (MBO) and *M. unilineatum* (MUN)] using *Artemia salina* (ARC test).

Materials and Methods

☞ Adult individuals of MBO and MUN were collected during April and May of 2021 on Mt. Avala and Krnjača (respectively), Belgrade, Serbia.

☞ The stock concentration of extracts used in ARC test was 20 mg/mL from which dilutions were made (range of concentrations 0,1 mg/mL - 0,003125 mg/mL).

☞ In a plate with 24 wells, 900 µl of seawater with *A. salina* larvae (10-15 per well) was placed and then 100 µL of tested extracts was added.

☞ Potassium dichromate (K₂Cr₂O₇) was used as a positive control and DMSO as a solvent control.

☞ The experiment was done in triplicate.

Megaphyllum unilineatum

Artemia salina

Megaphyllum bosniense

Results and Discussion

☞ LC₅₀ values for extracts of defensive secretions of MBO and MUN had similar values after 24h, while LC₅₀ of MBO was twice weaker after 48h in comparison with MUN (Table 1).

☞ Number of surviving individuals decreased with increasing concentration of tested extracts and increasing incubation time (Figure 1).

Table 1. LC₅₀ values of defensive secretions of *M. unilineatum* and *M. bosniense* after 24h and 48h.

LC ₅₀	24h	48h
MUN	68,56 µg/mL	29,12 µg/mL
MBO	73,23 µg/mL	47,18µg/mL
K ₂ Cr ₂ O ₇	24,4 µg/mL	13,5 µg/mL

Conclusions

☞ Both tested millipedes' defensive secretions extracts species showed toxic effect in ARC test.

☞ MBO extract has weaker toxic effect than the MUN extract.

☞ MUN is almost exclusively benzoquinone-based while esters are dominant in MBO extract.

☞ Many esters detected in MBO are new natural products and further studies are needed to determine their toxicological potential.

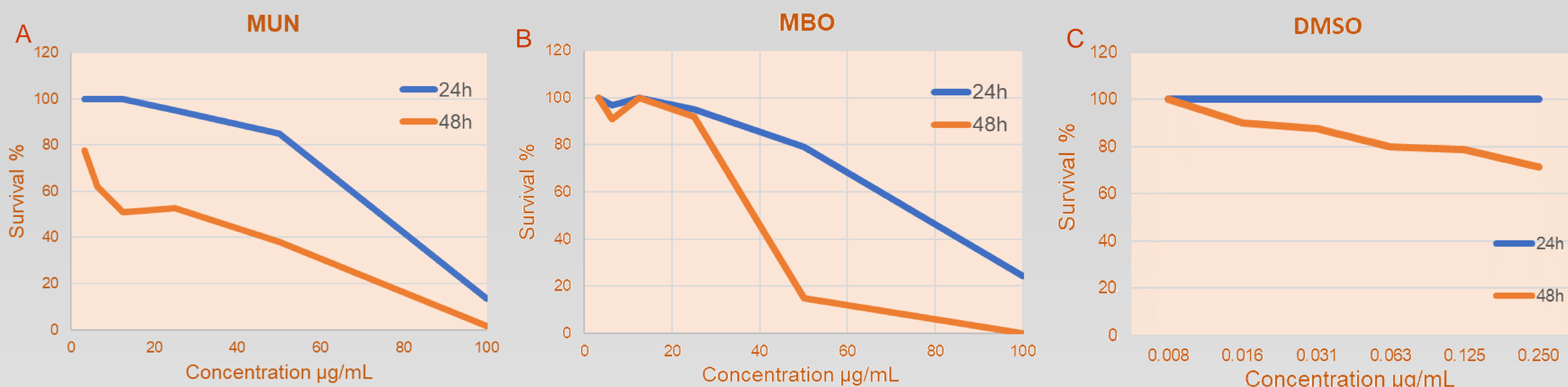


Figure 1. Survival of *A. salina* individuals after treatment with extracts of defensive secretions of A) *M. unilineatum* (MUN), B) *M. bosniense* (MBO) and C) solvent (DMSO).