

# 4<sup>th</sup> Glycobiology World Congress

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## Identification of peptides and glycopeptides with antimicrobial activity from garden snail *C. aspersum* using mass spectrometry

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The recent appearance of a growing number of bacteria resistant to conventional antibiotics has become a serious medical problem. Therefore the development of antibiotics, with novel mechanisms of action is a current issue. The mucus from the garden snail *C. aspersum* is a complex, multi-component mixture including different biochemical active substances. The mucus extract was separated into several fractions using Millipore filters with different size (10, 20 and 100 kDa). We have performed *in vitro* studies on the antimicrobial activities of different extracts, obtained from mucus of garden snail *C. aspersum*, against Gram+, Gram- bacteria and fungal strains *A. niger* and *A. fumigatus*. Our results have shown that fractions < 10 kDa, <20 kDa and between 1-10 kDa possess strong antimicrobial activity against the tested pathogens. To explain the observed effects against various microbial organisms, the peptides and glycopeptides in active fractions were purified by reversed phase high-performance liquid chromatography (RP-HPLC). All fractions were tested of the orcinol/H<sub>2</sub>SO<sub>4</sub> test. The positive fractions (glycopeptides) were lyophilized and further studied by Q-trap-LC/MS/MS. We identified the carbohydrate chains and amino acid sequences of several glycopeptides. Using tandem mass spectrometry MALDI-TOF-MS/MS, we identified the primary structures of 15 novel antimicrobial peptides in active fraction below 10kDa. Most of them contain high levels of glycine and leucine residues, but others contain proline, tryptophan and valine residues, typically for peptides with antimicrobial activity. Our results may be considered as basic information for further investigations on bioactive compounds from mucus of garden snail *C. aspersum*.

**Keywords:** mucus extracts, garden snail *Cornu aspersum*, antimicrobial peptides (AMPs), glycopeptides, mass spectrometry

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### Biography

Lyudmila Velkova works at laboratory "Chemistry and Biophysics of proteins and enzymes" at the Bulgarian Academy of Sciences (BAS). Her research interests include isolation, characterization and application of bioactive substances from natural sources, primarily proteins, glycoproteins, antimicrobial peptides, investigation of carbohydrate structures of glycoproteins by mass spectrometry, as and proteomics analysis. She defended PhD on the topic "Structure and function of carbohydrate chains of hemocyanin, isolated from the marine snail *Rapana venosa*" in Institute of Organic Chemistry with Centre of Phytochemistry - BAS, 2013. She has published more than 25 papers in reputed international journals.

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