



Abstracts

Glycopolymers of the Cell Walls in Classification of Representatives of the Cluster *Streptomyces albus*

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The investigations of the cell wall glycopolymers of the Actinobacteria representatives during a number of years led us to the conclusion that the structure and composition of cell wall glycopolymers is a valuable criteria in the taxonomy of these microorganisms.

The aim of this work was to study the composition and structure of cell wall glycopolymers of four members of the cluster *S. albus* which never studied in this aspect.

The structures of the glycopolymers were established using a combination of chemical and NMR spectroscopic methods. The cell wall of *S. albus* subsp. *albus* VKM Ac-35^T was found to be comprised of three glycopolymers, viz. unsubstituted 1,5-poly(ribitol phosphate), 1,3-poly(glycerol phosphate) substituted with β -D-glucopyranose, and the major polymer, a Kdn (3-deoxy-D-glycero-D-galacto-non-2-ulosonic acid)-teichulosonic acid: β -D-Glcp-(1 $\rightarrow$ 8)- α -Kdnp-[2[($\rightarrow$ 6)- β -D-Glcp-(1 $\rightarrow$ 8)- α -Kdnp-(2 $\rightarrow$)_n 6]- β -D-Glcp-(1 $\rightarrow$ 8)- β -Kdnp-(2-OH, where $n \geq 3$. The cell walls of '*S. albus*' J1074 and '*S. albus*' R1-100 were found to contain three glycopolymers of identical structures, viz. unsubstituted 1,3- and 2,3-poly(glycerol phosphates), and the major polymer, a Kdn-teichulosonic acid with an unusual structure that has not been previously described: β -D-Galp-(1 $\rightarrow$ 9)- α -Kdnp-[2[($\rightarrow$ 3)- β -D-Galp-(1 $\rightarrow$ 9)- α -Kdnp-(2 $\rightarrow$)_n 3]- β -D-Galp-(1 $\rightarrow$ 9)- β -Kdnp-(2-OH, where $n \geq 7-8$. The cell wall of *Streptomyces pathocidini* (formerly *S. albus* subsp. *pathocidicus* VKM Ac-598^T) was found to contain two glycopolymers, viz. 1,3-poly(glycerol phosphate) partially O-glycosylated with 2-acetamido-2-deoxy- α -D-glucopyranose and/or O-acylated with L-lysine, and a poly(diglycosyl 1-phosphate) of hitherto unknown structure: β -D-Glcp-(1 $\rightarrow$ 6)- α -D-GlcpNAc-(1-P-.

This study showed that the related strains '*S. albus*' J1074 and R1-100 [sensitive and resistant, respectively, to moenomycin A, which is a phosphoglycolipid antibiotic that inhibits the biosynthesis of peptidoglycan (Ostash and Walker, 2010)] contain the same composition and structure of glycopolymers. Thus the sensitivity/resistance to moenomycin A does not depend on the composition and structure of the cell wall glycopolymers.

The type strain of *S. albus*, VKM Ac-35^T, was found to have a distinct profile of cell wall glycopolymers. These data support the conclusion that '*S. albus*' J1074 and R1-100 belong to a distinct species, *S. albidoflavus* (Labeda et al., 2014). Likewise, the reclassification of *S. albus* subsp. *pathocidicus* VKM Ac-598^T as a novel species, *S. pathocidini* VKM Ac-598^T (Labeda et al., 2014) is supported by the differences between its cell wall glycopolymer profile and that of *S. albus* VKM Ac-35^T. Taking into account all the data discussed above, the value of determining the structure and composition of cell wall glycopolymers for the taxonomy and species specificity of the members of the genus *Streptomyces* becomes evident.

References

- Labeda, et al., 2014. *Int. J. Syst. Evol. Microbiol.* 64, 894–900.
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