

Title	Hybrid materials functionalized with carboxyl groups based on plant metabolites acting against human and agricultural pathogens
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Patent no.	MD 1598 Z, BOPI 09/2022; MD 1607 Z, BOPI 10/2022; MD 1611 Z, BOPI 11/2022; MD 1612 Z, BOPI 11/2022
Description	State Program (2020-2023), Innovative materials, technologies and products 20.80009.5007.17. P1P2-0487 1. Selective chemical transformation of the diterpenoid glycosides Steviozide and Rebaudiozide A into functionalized derivatives with carboxyl groups was carried out, retaining the native 19-O-glycosidic and ent-cauranoidic shells. Symmetric

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and asymmetric molecules with naturally occurring structural fragments joined via linker groups of different length and nature were obtained. Structure-property relationships have been determined for a series of new derivatives of the diterpenoid glycosides Steviozide and Rebaudiozide A. The level of inhibition of HIV-1 (strain IIIB) and HIV-2 (strain ROD) replication in acutely infected MT-4 cells was determined, with parallel determination of their cytotoxicity in the same cells. A number of new compounds were tested at different doses to reveal the optimal dose and their action on the facultative pathogen *Botrytis cinerea* Pers. The compounds MF-MZ-16, MF-EPS-165, MF-EPS-853 and MF-EPS-866 showed the most pronounced inhibitory activity for *F. oxysporum* and *F. aquaeductuum*. On the basis of the studies, new model formulations with the most effective properties were selected and developed, necessary to develop the optimal formulation for testing in the next steps under small plot production conditions to assess their fungistatic and fungicidal action.

2. As a result, the influence of new generation bioregulators in bee feed on the immunity, overwintering resistance and productivity of bee families was determined. The following patents were obtained during the project: MD 1598 Z 2022.09.30; MD 1607 Z 2022.10.31; MD 1611 Z 2022.11.30; MD 1612 Z 2022.11.30. Physico-chemical indices and the presence of heavy metals in bee products from different pedoclimatic zones were determined.

3. Active substances and auxiliaries were selected for the development of model formulations with plant metabolites, hybrid materials functionalised with carboxyl groups - bioregulators and natural stimulators for agriculture. In accordance with the properties and purpose of the active substances needed for the development of model formulations, the selection of auxiliary substances was carried out with emphasis on the groups of auxiliary substances recognised in the production of syrups by the mass-volume method. As auxiliary substances were tested: sugar, invert sugar, ethyl alcohol, purified water, glucose. Optimum ratio Sac: Or constitutes 1:63 - 1:33.