Studying the antimicrobial and antiviral potential of *Momordica charantia* L.

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Introduction. Antimicrobial drugs present on the pharmaceutical market today do not fully solve the problem of treating many infectious diseases. The presence of antibiotic-resistant strains, hospital and community-acquired infections, especially those caused by *P. aeruginosa, Pr. mirabilis, S aureus, E. coli, C. albicans* and others contribute to the search for new antimicrobial remedies, including those from medicinal plants.

Momordica charantia L. is an extremely useful plant due to its versatility as a food and therapeutic product, including its use for the creation of biological additives.

The aim of the study. To research the potential of antimicrobial and antiviral activity of herbal raw materials *M. charantia* in the form of various extracts and isolated active components.

Materials and methods. Analysis of scientific literature on the research topic.

Results and their discussion. According to the results of numerous studies, the pharmacological effectiveness of almost all parts of the plant *M. charantia* has been proven, at the same time, biologically active compounds were identified that are classified as carbohydrates, proteins, lipids, etc. The plant contains flavonoids, triterpenoids, saponins, alkaloids, polypeptides and sterols. Of particular interest are polysaccharides and proteins, which have a spectrum of different activities, including antimicrobial activity.

The most interesting results of the antimicrobial potential are shown by the seeds, pulp and leaves of the plant in the form of various extracts, namely, of water, ethanol, methanol and hydrophilic.

Sufficient antimicrobial activity of seeds from water and ethanol extracts against *S. aureus, M. luteus, E. coli, S. epidermidis* and *L. bulgaricus* was revealed.

The essential oils of the seeds of *M. charantia* have a significant inhibitory effect on *S. aureus*, while at the same time lesser on *E. coli* and *C. albicans*.

The plant pulp extract has a wide spectrum of antimicrobial effect on: *E. coli*, *Staphylococcus spp., Pseudomonas spp., Salmonella spp*. and *Streptobacillus spp*.

The most significant results were obtained in the study of hydrophilic and ethanol extracts of leaves against *Staphylococcus spp., Pseudomonas spp., Salmonella spp*. and *Streptobacillus spp*., while the ethanol fraction inhibits *S. aureus* and *B. cereus*, but does not affect *E. coli*. But a greater effect is observed in the case of studying of the methanol extract of the leaves. A significant inhibitory effect was noticed on *E. coli* and *S. aureus* and *S. enterica*, while no inhibitory activity was observed against methicillin-resistant *S. aureus* and *P. aeruginosa* in either hydrophilic or methanol extracts.

Not all components of the plant showed an antimycotic effect. The seed extracts also significantly inhibited the growth of *F. solani* in a dose-dependent manner, probably as a result of damage to the integrity of the cell nucleus and DNA.

The leaf extract showed little antimicrobial activity against *Candida albicans*.

The α-MMC component isolated from *M. charantia* exhibits a significant inhibitory effect on *P. aeruginosa* and the growth of *F. solani* and *F. oxysporum* mycelium.

A number of compounds isolated from *M. charantia* has antiviral activity, many of which are proteins and steroids. Cuguacin C and kuguacin E isolated from the root of M. charantia showed moderate anti-HIV-1 activity while exhibiting minimal cytotoxicity against uninfected cells. Components of MAP30 proteins identified in *M. charantia* may inhibit HIV activity, suppress the expression of the main protein of the p24 virus and virus-associated reverse transcriptase (HIV-RT), while having less effect on cellular DNA or protein synthesis in H9 cells. As a result of myocardial cell damage by the Coxsackievirus, the lectin component of MRK29, isolated from *M. charantia*, acts by inhibiting viral reverse transcriptase.

Conclusions. The leaf extract showed main results. Attention is focused on the presence of a large synergistic potential of extracts and fractions due to the presence of secondary metabolites in the *M. charantia* herbal material, such as steroids, flavonoids, alkaloids and tannins, which enhance the antimicrobial effect. The antifungal effect of the studied compositions was shown by seed extracts and insignificant by leaf extracts. Components of *M. charantia* proteins are able to inhibit the enzymes of the proteins of some viruses and suppress the expression of proteins of the HIV virus.

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