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Plant Extracts with Antiviral Activity as Food Supplement and Alternative to Monotherapy for Viral Infections

Nikolay Manchev Petrov[1], Mariya Ivanova Stoyanova[2], Iskra Vitanova Ivanova[3]

[1.] Virology Lab NBU, Virology lab, New Bulgarian University, Montevideo str. 21, 1618 Sofia, Bulgaria;
[2.] ISSAPP, AA, ISSAPP “Nikola Pushkarov", Agricultural Academy, 7 Shose Bankya Str., 1331 Sofia, Bulgaria;
[3.] SU St. Kl. Ohridski, Sofia University St. Kliment Ohridski, 8, Bul. Dragan Tzankov, 1164 Sofia, Bulgaria;

Viruses affect seriously humans, animals, plants and other eukaryotic organisms. They are pathogenic organisms that pose a threat to the economy on a national and global scale, affecting not only people, significantly and seriously reducing their working capacity for a significant period of time, but also to the global health of ecosystems. They are highly variable, cause epidemics and change rapidly when applied therapy and prophylaxis. Many of them are the cause of millions of deaths in the world. Currently, there are only a few preferred and proven antiviral drugs, which unfortunately are effective only against a limited set of viruses. Research on natural products can be an effective strategy for the development of new potent antiviral drugs. In this regard, plant extracts represent a significant natural resource for use against various viral infections. Viral infections represent a major challenge in medicine due to various factors such as viral mutations, new viral strains and variants, toxic effects of viral infection, severity of disease, intracellular cytopathic effects and limited availability of effective antiviral drugs. Despite the progress in immun?-prophylaxis and specific antiviral therapy, there is a need to develop new and more effective antiviral compounds and alternative highly effective therapeutic regimens. On the other hand, plants produce natural secondary metabolites (as natural defense mechanisms against various environmental pests) that show antiviral activity. These secondary metabolites include compounds of basic chemical compounds such as alkaloids, flavonoids, polyphenols, carbohydrates and essential oils. Various chemical analytical methods such as HPLC, GC-MS and NMR spectroscopy are used to identify and characterize these bioactive compounds. Flavonoids, terpenoids, lignans, sulfides, polyphenols, coumarins, and saponins are among the groups of bioactive compounds found in plants that have shown antiviral activity against viruses such as herpes, coronaviruses, HIV, influenza, hepatitis, and others. The use of different solvents and extraction techniques allows the extraction and fractionation of different complexes of active compounds with different effects, including antiviral activity. Screening of plant extracts and isolation of active compounds allows scientists to identify potential new antiviral drugs. In vitro and in vivo studies have shown significant antiviral activity of plant extracts and their bioactive compounds. The use of advanced analytical techniques helps in the identification and characterization of bioactive compounds that target different stages of the viral life cycle. Many plant extracts and compounds with antiviral activity against specific viruses, human, animal, plant, and others, have been reported in scientific publications. The present review highlights the ongoing research on natural sources, especially plants, for the discovery of new and effective antiviral compounds, their safety, drug interactions, and combination therapies. The extraction of specific combinations of substances and complexes with antiviral activity by their extraction with different solvents represents an alternative for combating viral infections. Due to their very low or no toxicity, they can be included in food supplements to improve human health.

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