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Plant-Derived Compounds with Therapeutic Potential for the Treatment of Human Coronavirus Diseases

| Review | Published: 20 June 2024

| (2024) [Cite this article](#)



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Abstract

Since the advent of modern civilization, few diseases have caused more worldwide socioeconomic disruptions than COVID-19 caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). In some countries, very high proportion of the population have contracted the disease even though it is fatal in only a small percentage of those carrying the virus. In addition to physical measures (social distancing, handwashing, sterilization, etc.), two main pharmaceutical interventions have been adopted: the development of vaccine/mass vaccination and therapeutic intervention. The recent discovery of SARS-CoV-2 transmission among vaccinated individuals and changes in the genome of the virus arising from mutation leading to new variants (delta, omicron, IHU etc.) suggest the importance of therapeutic intervention targeting different aspects of the molecular mechanisms involved in its virulence. Therapeutic agents targeting essential elements required for viral propagation in the host may also find application in the management of other viral diseases such as Ebola, Zika, and HIV/AIDS. Targets for drug design include the 16 non-structural proteins, RNA-dependent DNA polymerase, esterase, membrane proteins, spike and envelope proteins, protease and nucleocapsid proteins, and helicase, all present on the virus; host proteases and receptors. Both medicinal plant-derived and synthetic compounds including monoclonal antibodies are now suggested as candidate drugs for COVID-19 and are being developed as suitable therapeutic agents. In this review, some useful information on promising plant-derived therapeutic agents are provided which may be of value in the development of drugs for COVID-19 and other viral diseases.

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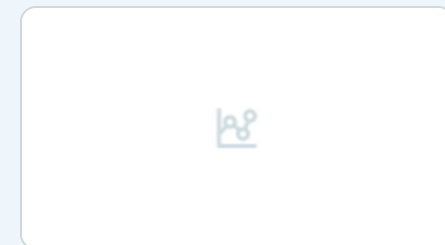
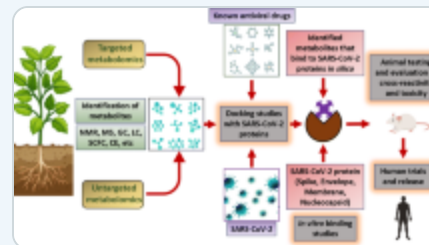
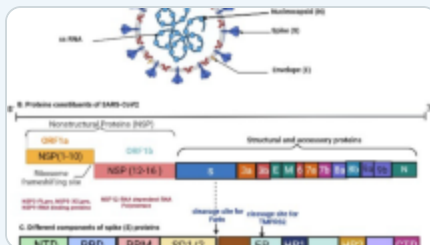
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Data Availability

Not applicable.

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Funding

“This work was carried out under the COVID-19 Africa Rapid Grant Fund supported under the auspices of the Science Granting Councils Initiative in Sub-Saharan Africa (SGCI) and administered by South Africa’s National Research Foundation (NRF) in collaboration with Canada’s International Development Research Centre (IDRC), the Swedish International Development Cooperation Agency (Sida), South Africa’s Department of Science and Innovation (DSI), the Fonds de Recherche du Quebec (FRQ), the United Kingdom’s Department of International Development (DFID), United Kingdom Research and Innovation (UKRI) through the Newton Fund, and the SGCI participating councils across 15 countries in sub-Saharan Africa.”

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Contributions

Isaac Olusanjo Adewale involved in conceptualization, validation, resources, supervision, funding acquisition, and writing—reviewing and editing. Oladoyin Grace Famutimi involved in investigation, data curation, visualization, formal analysis, and writing—original draft preparation. Oghenesivwe Osiebe involved in data curation, investigation, and writing.

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Ethics declarations

Conflict of interest

The authors declare no competing interests.

Ethical Approval

Not applicable.

Consent for Publication

Not applicable.

Additional information

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Significance statement: This review highlights the therapeutic potential of plant-derived compounds for managing viral diseases, particularly human coronavirus diseases. These natural compounds target various aspects of the virus's lifecycle and offer a promising alternative or complement to vaccines, especially in light of emerging variants and vaccine-resistant strains. Please let me know if any further information is required.

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Adewale, I.O., Famutimi, O.G. & Osiebe, O. Plant-Derived Compounds with Therapeutic Potential for the Treatment of Human Coronavirus Diseases. *Proc. Natl. Acad. Sci., India, Sect. B Biol. Sci.* (2024). <https://doi.org/10.1007/s40011-024-01658-5>

Received

02 December 2022

Revised

07 May 2024

Accepted

05 June 2024

Published

20 June 2024

DOI

<https://doi.org/10.1007/s40011-024-01658-5>

Keywords

[COVID-19](#)

[SARS-CoV-2](#)

[Therapeutics](#)

[Plant-derived compounds](#)