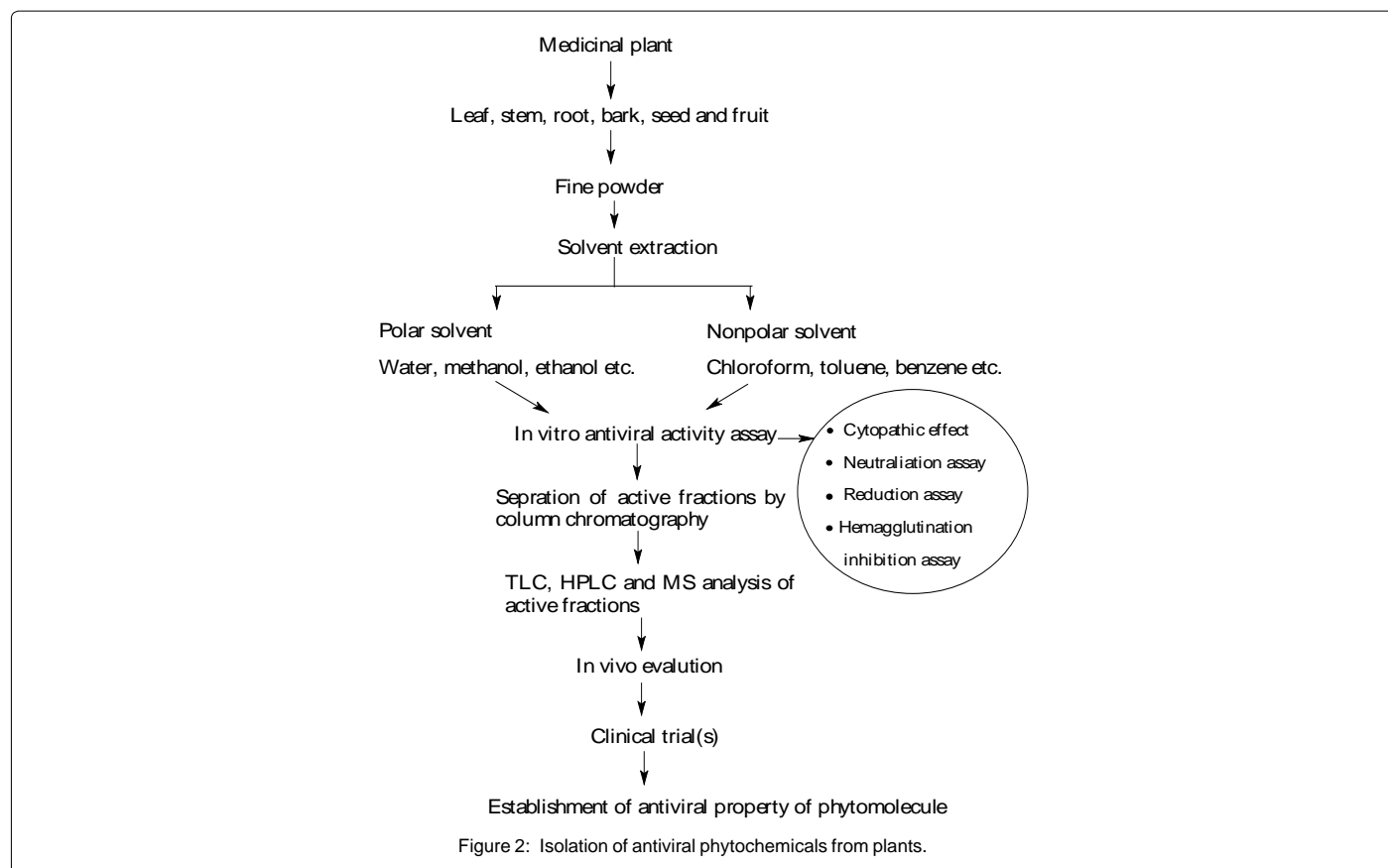


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64. *Tanacetum vulgare* L. (Asteraceae) is a well-known medicinal herb. It has been reported to possess antiviral activity against various viruses, including HIV-1, hepatitis B virus (HBV), and hepatitis C virus (HCV). The active constituents of *Tanacetum vulgare* are believed to be responsible for its antiviral effects.

65. *Limonium sinense* (L.) DC. (Plumbaginaceae) is another medicinal herb. It has been shown to have antiviral activity against HIV-1 and HBV. The active constituents of *Limonium sinense* are thought to be responsible for its antiviral properties.

Artocarpus lakoocha (Forsk.) (Moraceae) is a medicinal tree. It has been reported to possess antiviral activity against HIV-1 and HBV. The active constituents of *Artocarpus lakoocha* are believed to be responsible for its antiviral effects.

Pterocarya stenoptera (L.) (Pterocarpaceae) is a medicinal tree. It has been shown to have antiviral activity against HIV-1 and HBV. The active constituents of *Pterocarya stenoptera* are thought to be responsible for its antiviral properties.

67. *Bupleurum koidae* (Umbelliferae) is a medicinal herb. It has been reported to possess antiviral activity against HIV-1 and HBV. The active constituents of *Bupleurum koidae* are believed to be responsible for its antiviral effects.

Ruta angustifolia (L.) (Rutaceae) is a medicinal herb. It has been shown to have antiviral activity against HIV-1 and HBV. The active constituents of *Ruta angustifolia* are thought to be responsible for its antiviral properties.

Liriope platyphylla (L.) (Lamiaceae) is a medicinal herb. It has been reported to possess antiviral activity against HIV-1 and HBV. The active constituents of *Liriope platyphylla* are believed to be responsible for its antiviral effects.

Citrus reticulata (L.) (Rutaceae) is a medicinal fruit. It has been shown to have antiviral activity against HIV-1 and HBV. The active constituents of *Citrus reticulata* are thought to be responsible for its antiviral properties.

68,69. *Scheera heptaphylla* (L.) (Simarubaceae) is a medicinal tree. It has been reported to possess antiviral activity against HIV-1 and HBV. The active constituents of *Scheera heptaphylla* are believed to be responsible for its antiviral effects.

Saururus chinensis (L.) (Lamiaceae) is a medicinal herb. It has been shown to have antiviral activity against HIV-1 and HBV. The active constituents of *Saururus chinensis* are thought to be responsible for its antiviral properties.

71. *Artocarpus lakoocha* (Forsk.) (Moraceae) is a medicinal tree. It has been reported to possess antiviral activity against HIV-1 and HBV. The active constituents of *Artocarpus lakoocha* are believed to be responsible for its antiviral effects.

Challenges and future avenues

in medicinal plants in the future.

Conclusion

The present study has demonstrated the antiviral activity of various phytochemicals against HIV-1. The results show that the phytochemicals tested, including flavonoids, terpenoids, and alkaloids, exhibit significant inhibitory effects on HIV-1 replication. The mechanism of action involves the inhibition of viral entry, reverse transcription, and integration. The study also highlights the potential of these phytochemicals as natural antiviral agents and their role in the development of novel antiviral drugs. Further research is needed to elucidate the precise mechanisms of action and to optimize the use of these compounds in clinical settings.

in the present study, the phytochemicals tested, including flavonoids, terpenoids, and alkaloids, exhibit significant inhibitory effects on HIV-1 replication. The mechanism of action involves the inhibition of viral entry, reverse transcription, and integration. The study also highlights the potential of these phytochemicals as natural antiviral agents and their role in the development of novel antiviral drugs. Further research is needed to elucidate the precise mechanisms of action and to optimize the use of these compounds in clinical settings.

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References

1. Orhan I, Deliorman-Orhan D, Ozçelik B (2009) Lipophilic extracts of various

46. Scaglia LFN, Retailleau P, Paolini J, Pannecouque C, Neyts J, et al. (2014) Jatrophone diterpenes as inhibitors of chikungunya virus replication: Structure-activity relationship and discovery of a potent lead. *J Nat Prod* 77: 1505-1512.
- 47.