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Antiviral Effects of Medicinal Plants: Minireview

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Abstract:
Thousands of herbs & plants are present in the whole world which are studied & have significance as anti-viral novel agents. Frequently used important phyto components of the plants are peptides, proteins, thiophene, polyines, alkaloids, furly component, saponins, coumarins, polyphenolics, sulphides, lignans, terpenoids, flavonoids, and many more. All these components have the potential to work against different infections. Herbal tea, spices, culinary herbs, and volatile oil all possess anti-viral properties. Scientists do their research on antiviral effective plants to overcome viral infection. usually,plant extract& formulation are used to inhibit either the ribonucleic acid or deoxyribonucleic acid activities to prevent the spread of viral infection. in this paper, we studied the plants & their formulation against viral infection families like Herpesviridae, hepadnaviridae, and retroviridae. This study found many medicinal plants and their extracts effective against viral and bacterial infections, The contemporary Corona virus is one of the viruses affected by the extracts of these plants, such as Amelanchier alnifolia, rosa nutkana. Root and branch extract of racemose sambucus, potentilla arguta, and lomatiumdissectum used against syncytial respiratory and rotavirus viruses. Influenza , para-influenza type 3 , herpes simplex , poliovirus, river ross, cytomegalo human & DNA viruses are the most prominent viruses affected by extracts of medicinal plants. The roots are the most important and effective part for obtaining effective medicinal plant extracts. Marine algae and Marine herbs possesses several therapeutic effects like anti-mutagenic properties, anti-viral, immunological, cholesterol regulation & anti-influenza. These extracts act as antivirals in several ways, including: anti-human immunodeficiency & effects on the viral replication at the intracellular level. This review demonstrates that there is an abundance of medicinal plants and herbs with untapped therapeutic potential for use against a wide range of viruses.

Keywords: Antivirals, novel agents, herbs, natural plants, antiviral activities, viruses, anti-microbial effects.

Introduction

Viruses contain lots of genes either in the form of ribonucleic acid or deoxyribonucleic acid which is surrounded by the envelope of lipids & these are obligate parasites. Propagation of viruses occurs via host cells (Abad *et al*. 2000). The viral infection spread easily & it affects one person to other. By doing therapeutic & prophylactic measurements viral infection can be controlled. Several antiviral chemotherapiesare designed to get rid ofthe herpes virus (De Clercq, 1997). All around the world people used natural &plant-derivative medicine to curea viral infection(Akash, 2021). The overall maximum population used natural products for the prevention & management of medical problems.

Various pharmaceutical companies used plant extract & herbs for the formulation of anti-microbial drugs. But till now there are unlimited sources of natural plants present. These plants & their parts are rich sources of various phytochemical components like flavonoids (Castilla et al.1998; Yadav and Agarwala,2011), lignin, glycosides, essential oil (Cox *et al*. 2001; Swamy and Sinniah,2015), peptides, clanolides, galactans, polysaccharides,etc (Craig *et al*. 2001; Orhan *et al*. 2010; Abuajah *et al*. 2015; Jiang *et al*. 2020). These phytochemical components are effectively used to treat many viral, bacterial, and fungal infections. people used these plant parts in different forms like capsules, powders, decoction & syrup, etc. these plants possess anti-viral, anti-bacterial (Gao, 2014), anti-fungal, and antimicrobial properties (Zhang *et al*. 2013; Mudhafar *et al*. 2019).

According to research, up to 40% of drugs are synthesized by using plants & their extract (Jacobson *et al*. 2001; Pirtarighat *et al*. 2019). These phytochemicals have a wide range of functions, including antiviral actions by blocking the replication of viruses or their DNA or RNA (Küp *et al*.2020). A root extract of Eleutherococcus senticosus was effective against three human viruses: rotavirus (HRV), respiratory syncytial virus (RSV), and influenza A virus (Glatthaar-Saalmuller *et al*. 2001). Water-soluble extract of Sanicula europaea (L.) has been shown to suppress influenza RNA in related research (Turan *et al*. 1996).

Natural Medicine and its Anti-Viral Properties

Several natural plants are used for the formation of synthetic drugs these medicinal plants are rich sources against viral infection. In Europe after the 2nd world war & in 1952 drug boots company in England, Nottingham, scientistsresearched interest in the antiviral agent (D'Cruz, and Uckun, 2001; Bud2007), and they almost worked at 288 plants and understand their action against viral infection. in these plants around twelve plants are those which reduced the amplification of the virus. Over the previous 25 years, lots of work & broad screening programs are started which show anti-viral properties(Chattopadhyay *et al*. 2009).

In 1970 researchers of Canadian perform lots of work against various viruses like echovirus, coxsackievirus, poliovirus, and herpes simplex virus. Almost 100 Columbian British natural plants were screened against 7 viruses and these show anti-viral properties. From the concentration test, it was confirmed that around 12 plants extract show anti-viral properties (Liu *et al*. 2012). Natural plant & their extract which are effective against the coronavirus are extracts of Amelanchier alnifolia, rosa nutkana. Root and branch extract of racemose sambucus& potentilla arguta used against syncytial respiratory virus (Mazraedoost *et al*. 2021). Lpomopsis aggregate extract demonstrated significant anti-viral properties against the para-influenza type 3 virus. The root extract of lomatiumdissectum completely showsan inhibitory effect against rotavirus. Combination of plant extract effective against herpes simplex virus type 1& these plants are Thapsus Verbascum, polypodium glycyrrhiza, lysichiton Americanum, conocephalumconicum, cardamine angulate. In traditional medicine (Chung *et al*. 1996; Behl *et al*. 2022).

The extract of 40 plants is show anti-viral properties against poliovirus, river ross virus, cytomegalo human virus & DNA viruses (Jassim and Naji. 2003; Karthick and Akram, 2020). The most significant extract was obtained from the roots & aerial parts of longifolia dianella grandis & sphacelatumpterocaulon which show inhibitory effects against poliovirus. The plants extract of scaevola spinescens& euphorbia australis possess significant effects against human cytomegalovirus (Cock *et al*. 2021; Mani *et al*. 2021). The activity of ross river virus is suppressed after using the extract of macrocarpa phylliraeoides &

eremophilalatrobei. The liquid extract of Eleutherococcus senticosus roots is effective against influenza, RSV and human rotavirus, herpes simplex type 1 virus, adenovirus, and DNA viruses (Gauntt *et al*. 2000; Behl *et al*. 2021).

Using the water-soluble extract of Sanicula Europaea shows an inhibitory effect against the influenza virus (Wang *et al*. 2006). Sanicula Europaea is the most potent plant which effective against para-influenza type ii virus (Asres *et al*. 2005). Some other medicinal plants which are rich sources of viral infection include dittrichia viscose, magnolii sanguisorba minor, nepeta tuberosa, sandalwood, nepeta nepitella, nepeta coerulea(Pal *et al*. 2022). The leaf extract of azadirachta indica is effective against the herpes virus , poliomyelitis, poxvirus, chicken pox &smallpox(Barnard et al. 1993). The intracellular ribonucleic acid & deoxyribonucleic acid are inhibited through the extract of opuntia streptacantha (González-Ponce *et al*. 2016). The genus of phallanthuspossesses significant effects against viral infection (Calixto *et al*. 1998), NerumIndicum, melia azedarach Bergenia ligulate &holoptelia integrifolia are effective against HSV & influenza viruses (Karagöz *et al*. 1999).

Herbs and Their Anti-Viral Effects:

As we already discussed that medicinal plants or effective against severalinfections, also the role of marine herbs is significant in clinical & pre-clinical evaluation. Marine algae are one of the rich sources of viral infection. it has anti-viral properties. The pre-clinical testing shows that unicellular cyanobacteria filamentous spirulina possesses several therapeutic effects like anti-mutagenic properties, anti-viral, immunological, cholesterol regulation & anti-influenza (Balasubramaniam *et al*. 2021; Yedjou *et al*. 2021). The water extract of denudate polysiphonia, hasleaostrearia demonstrated inhibitory effects against herpes simplex viruses effects on the viral replication at the intracellular level (Vo *et al*. 2011).

The inhibitory effects of marine algae against cyanovirin& human immune deficiency virus are significant (Schaeffer and Krylov, 2000; Besednova *et al*. 2019). These show anti-herpes simplex & anti-human immunodeficiency effects (Calabrese *et al*. 2000; Asres *et al*. 2001). For anti-viral activity, the presence of the sulfate group is good because the anti-viral degree increases with the increase of concentration. Black tea extract (Aron and Kennedy, 2008), the bark of virginiana (Duarte *et al*. 2001), aloe extract, extract Sudanese (Rezazadeh *et al*. 2016; Walker *et al*. 2018), and extract of bitter thai (Mathur *et al*. 2017), the fruit extract like beverages of apple, wine, and grapes extract (Aron and Kennedy, 2008), all show anti-viral properties (Pappas *et al*. 2009; Liu *et al*. 2012; Cano-Avendaño *et al*. 2021).

Conclusion

Novel anti-viral agents are significant components which effectively used against several viral infections like bacterial infections, and viruses'infections. plant derivate extract effects against covid 19 infection and influenza virus. In this paper different plants & their parts extract which are medicinally active and used to treat different viral infections. many advancements need to improve the natural plant formulation to overcome these infections.

References

1. Abad, M. J., Guerra, J. A., Bermejo, P., Irurzun, A., & Carrasco, L. (2000). Search for antiviral activity in higher plant extracts. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 14. Phytotherapy Research, 8(8), 604–607. doi:10.1002/1099-1573(200012)14:8<604::aid-ptr678>3.0.co;2-l
2. Abuajah, C. I., Ogbonna, A. C., & Osuji, C. M. (2015). Functional components and medicinal properties of food: A review. Journal of Food Science and Technology, 52(5), 2522–2529. doi:10.1007/s 13197-014-1396-5
3. Akash, M. S. (2021). A review on antibacterial properties of natural plants. Int. J. Adv. Res. Biol. Sci., 8(2).
4. Aron, P. M., & Kennedy, J. A. (2008). Flavan-3-ols: Nature, occurrence and biological activity. Molecular Nutrition and Food Research, 52(1), 79–104. doi:10.1002/mnfr.200700137
5. Asres, K., Bucar, F., Kartnig, T., Witvrouw, M., Pannecouque, C., & De Clercq, E. (2001). Antiviral activity against human immunodeficiency virus type 1 (HIV-1) and type 2 (HIV-2) of ethnobotanically selected

Ethiopian medicinal plants. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 15. Phytotherapy Research, 1(1), 62–69. doi:10.1002/1099-1573(200102)15:1<62::aid-ptr956>3.0.co;2-x

6. Asres, K., Seyoum, A., Veeresham, C., Bucar, F., & Gibbons, S. (2005). Naturally derived anti-HIV agents. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 19. Phytotherapy Research, 7(7), 557–581.doi:10.1002/ptr.1629
7. Balasubramaniam, V., Gunasegavan, R. D. N., Mustar, S., Lee, J. C., & Mohd Noh, M. F. (2021). Isolation of industrial important bioactive compounds from microalgae. Molecules, 26(4), 943. doi:10.3390/molecules26040943
8. Barnard, D. L., Smee, D. F., Huffman, J. H., Meyerson, L. R., & Sidwell, R. W. (1993). Antiherpesvirus activity and mode of action of SP-303, a novel plant flavonoid . Chemotherapy , 39(3), 203–211.doi:10.1159/000239127
9. Behl, T., Rocchetti, G., Chadha, S., Zengin, G., Bungau, S., Kumar, A., . . . and Montesano, D. (2021). Phytochemicals from plant foods as potential source of antiviral agents: An overview. Pharmaceuticals, 14(4), 381. doi:10.3390/ph14040381
10. Besednova, N. N., Zvyagintseva, T. N., Kuznetsova, T. A., Makarenkova, I. D., Smolina, T. P., Fedyanina, L. N., . . . and Zaporozhets, T. S. (2019). Marine algae metabolites as promising therapeutics for the prevention and treatment of HIV/AIDS.Metabolites, 9(5), 87. doi:10.3390/metabo9050087
11. Bud, R. (2007). Penicillin: Triumph and tragedy. Oxford university press on demand.
12. Calabrese, C., Berman, S. H., Babish, J. G., Ma, X., Shinto, L., Dorr, M., . . . and Standish, L. J. (2000). A phase I trial of andrographolide in HIV positive patients and normal volunteers. Phytotherapy Research, 14(5), 333–338. doi:10.1002/1099-1573(200008)14:5<333::aid-ptr584>3.0.co;2-d
13. Calixto, J. B., Santos, A. R., Cechinel Filho, V. C., & Yunes, R. A. (1998). A review of the plants of the genus Phyllanthus: Their chemistry, pharmacology, and therapeutic potential. Medicinal Research Reviews, 18(4), 225–258. doi:10.1002/(sici)1098-1128(199807)18:4<225::aid-med2>3.0.co;2-x
14. Cano-Avendaño, B. A., Carmona-Hernandez, J. C., Rodriguez, R. E., Taborda-Ocampo, G., & González-Correa, C. H. (2021). Chemical properties of polyphenols: A reviewfocusedonanti-inflammatory and anti-viral medical application. Biomedicine, 41(1), 3–8. doi:10.51248/.v41i1.524
15. Castilla, V., Barquero, A. A., Mersich, S. E., & Coto, C. E. (1998). In vitro anti-Junin virus activity of a peptide isolated from Melia azedarach L. leaves. International Journal of Antimicrobial Agents, 10(1), 67–75. doi:10.1016/ s0924-8579(98)00011-9
16. Chattopadhyay, D., Sarkar, M. C., Chatterjee, T., Sharma Dey, R., Bag, P., Chakraborti, S., & Khan, M. T. (2009). Recent advancements for the evaluation of anti-viral activities of natural products. New Biotechnology, 25(5), 347–368. doi:10.1016/j.nbt.2009.03.007
17. Chung, F. J. (1996). Interests and policies of the state of Sarawak, Malaysia regarding intellectual property rights for plant derived drugs. Journal of Ethnopharmacology, 51(1–3), 201–204. doi:10.1016/0378-8741(95)01362-8
18. Cock, I. E. (2011). Medicinal and aromatic plants–Australia. Ethnopharmacology, encyclopedia of life support systems (EOLSS).
19. Cox, S. D., Mann, C. M., & Markham, J. L. (2001). Interactions between components of the essential oil of Melaleuca alternifolia. Journal of Applied Microbiology , 91(3),492–497. doi:10.1046/j.1365-2672.2001.01406.x
20. Craig, M. I., Benencia, F., & Coulombié, F. C. (2001). Antiviral activity of an acidic polysaccharides fraction extracted from Cedrela Tubiflora leaves. Fitoterapia, 72(2), 113–119. doi:10.1016/s0367-326x(00)00263-x
21. D'Cruz, O. J., & Uckun, F. M. (2001). Pokeweed antiviral protein: A potential nonspermicidal prophylactic antiviral agent. Fertility and Sterility, 75(1), 106–114. doi:10.1016/s0015-0282(00)01665-4
22. De Clercq, E. R. I. K. (1997). In search of a selective antiviral chemotherapy. Clinical

Microbiology Reviews, 10(4), 674–693. doi: 10.1128/CMR.10.4.674

23. Duarte, M. E. R., Noseda, D. G., Noseda, M. D., Tulio, S., Pujol, C. A., & Damonte, E. B. (2001). Inhibitory effect of sulfated galactans from the marine alga Bostrychia montagnei on herpes simplex virus replication in vitro. Phytomedicine, 8(1), 53–58. doi:10.1078/0944-7113-00007
24. Gao, Q. (2014). Elucidation of arctigenin biotransformation through its biopharmaceutics and pharmacokinetics profiling. Hong Kong: Chinese University of Hong Kong.
25. Gauntt, C. J., Wood, H. J., McDaniel, H. R., & McAnalley, B. H. (2000). Aloe polymannose enhances anti-coxsackievirus antibody titres in mice. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 14. Phytotherapy Research, 4(4), 261–266. doi:10.1002/1099-1573(200006)14:4<261::aid-ptr579>3.0.co;2-a
26. Glatthaar-Saalmüller, B., Sacher, F., & Esperester, A. (2001). Antiviral activity of an extract derived from roots of Eleutherococcus senticosus. Antiviral Research, 50(3), 223–228. doi:10.1016/s0166-3542(01)00143-7
27. González-Ponce, H. A., Martínez-Saldaña, M. C., Rincón-Sánchez, A. R., Sumaya-Martínez, M. T., Buist-Homan, M., Faber, K. N., . . . and Jaramillo-Juárez, F. (2016). Hepatoprotective effect of Opuntia robusta and Opuntia streptacantha fruits against acetaminophen-induced acute liver damage. Nutrients, 8(10), 607. doi:10.3390/nu8100607
28. Jacobson, J. M., Feinman, L., Liebes, L., Ostrow, N., Koslowski, V., Tobia, A., . . . and Prince, A. M. (2001). Pharmacokinetics, safety, and antiviral effects of hypericin, a derivative of St. John's wort plant, in patients with chronic hepatitis C virus infection. Antimicrobial Agents and Chemotherapy, 45(2), 517–524. doi:10.1128/AAC.45.2.517-524.2001
29. Jassim, S. A., & Naji, M. A. (2003). Novel antiviral agents: A medicinal plant perspective. Journal of Applied Microbiology , 95(3), 412–427. doi:10.1046/j.1365-2672.2003.02026.x
30. Jiang, T., Ye, S., Liao, W., Wu, M., He, J., Mateus, N., & Oliveira, H. (2022). The botanical profile, phytochemistry, biological activities and protected-delivery systems for purple sweet potato (Ipomoea batatas (L.) Lam.): An up-to-date review. Food Research International, 161, 111811.doi:10.1016/j.foodres.2022.111811
31. Karagöz, A., Arda, N., Gören, N., Nagata, K., & Kuru, A. (1999). Antiviral activity of Sanicula europaea L. extracts on multiplication of human parainfluenza virus type 2. Phytotherapy Research, 13(5), 436–438. doi:10.1002/(sici)1099-1573(199908/09)13:5<436::aid-ptr459>3.0.co;2-q
32. Karthick, R., & Akram, M. (2020). Antiviral medicinal plants and their chemical constituents, experimental and Clinical Pharmacology of antiviral plants. Journal of Science Technology and Research (JSTAR), Volume, 1.
33. Küp, F. Ö., Çoşkunçay, S., & Duman, F. (2020). Biosynthesis of silver nanoparticles using leaf extract of Aesculus hippocastanum (horse chestnut): Evaluation of their antibacterial, antioxidant and drug release system activities. Materials Science and Engineering. C, Materials for Biological Applications, 107, 110207.doi:10.1016/j.msec.2019.110207
34. Liu, A. L., & Du, G. H. (2012). Antiviral properties of phytochemicals. In Dietary phytochemicals and microbes (pp. 93–126). , The NetherlandsBerlin: Springer.
35. Mani, J. S., Johnson, J. B., Hosking, H., Ashwath, N., Walsh, K. B., Neilsen, P. M., . . . and Naiker, M. (2021). Antioxidative and therapeutic potential of selected Australian plants: A review. Journal of Ethnopharmacology , 268,113580.doi:10.1016/j.jep.2020.113580
36. Mathur, S., Bulchandan, N., Parihar, S., & Shekhawat, G. S. (2017). Critical review on steviol glycosides: Pharmacological, toxicological and therapeutic aspects of high potency zero caloric sweetener. International Journal of Pharmacology, 13(7), 916–928. doi:10.3923/ijp.2017.916.928
37. Mazraedoost, S., Behbudi, G., Mousavi, S. M., & Hashemi, S. A. (2021). Covid-19 treatment by plant compounds. Advances in Applied Nanobiol.-Technologies, 2(1), 23–33.
38. Mudhafar, & M. U. S. T. A. F. (2019). Medical values, antimicrobial, and anti fungal

activities of Polyalthia genus. A, & Zainol, I. International Journal of Pharmaceutical Research, 11(1), 90–96.
39. Orhan, D. D., Özçelik, B., Özgen, S., & Ergun, F. (2010). Antibacterial, antifungal, and antiviral activities of some flavonoids. Microbiological Research, 165(6), 496–504. doi:10.1016/j.micres.2009.09.002
40. Pal, S., Chowdhury, T., Paria, K., Manna, S., Parveen, S., Singh, M., . . . and Mandal, S. M. (2022). Brief survey on phytochemicals to prevent COVID-19. Journal of the Indian Chemical Society, 99(1),100244.doi:10.1016/j.jics.2021.100244
41. Pappas, E., & Schaich, K. M. (2009). Phytochemicals of cranberries and cranberry products: Characterization, potential health effects, and processing stability. Critical Reviews in Food Science and Nutrition, 49(9), 741–781. doi:10.1080/10408390802145377
42. Pirtarighat, S., Ghannadnia, M., & Baghshahi, S. (2019). Green synthesis of silver nanoparticles using the plant extract of Salvia spinosa grown in vitro and their antibacterial activity assessment. Journal of Nanostructure in Chemistry, 9(1), 1–9. doi:10.1007/s40097-018-0291-4
43. Rezazadeh, F., Moshaverinia, M., Motamedifar, M., & Alyaseri, M. (2016). Assessment of anti HSV-1 activity of Aloe vera gel extract: An in vitro study. Journal of Dentistry, 17(1), 49–54.
44. Schaeffer, D. J., & Krylov, V. S. (2000). Anti-HIV activity of extracts and compounds from algae and cyanobacteria. Ecotoxicology and Environmental Safety, 45(3), 208–227. doi:10.1006/eesa.1999.1862
45. Swamy, M. K., & Sinniah, U. R. (2015). A comprehensive review on the phytochemical constituents and pharmacological activities of Pogostemon cablin Benth.: An aromatic medicinal plant of industrial importance. Molecules, 20(5), 8521–8547. doi:10.3390/molecules20058521
46. Turan, K., Nagata, K., & Kuru, A. (1996). Antiviral effect of Sanicula europaea L. leaves extract on influenza virus-infected cells. Biochemical and Biophysical Research Communications, 225(1), 22–26. doi:10.1006/bbrc.1996.1125
47. Vo, T. S., Ngo, D. H., Van Ta, Q. V., & Kim, S. K. (2011). Marine organisms as a therapeutic source against herpes simplex virus infection. European Journal of Pharmaceutical Sciences, 44(1–2), 11–20. doi:10.1016/j.ejps.2011.07.005
48. Walker, D. G., Tang, T. M., & Lue, L. F. (2018). Increased expression of toll-like receptor 3, an anti-viral signaling molecule, and related genes in Alzheimer's disease brains. Experimental Neurology, 309, 91–106. doi:10.1016/j.expneurol.2018.07.016
49. Wang, X., Jia, W., Zhao, A., & Wang, X. (2006). Anti-influenza agents from plants and traditional Chinese medicine. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 20. Phytotherapy Research, (5), 335–341.doi:10.1002/ptr.1892
50. Yadav, R. N. S., & Agarwala, M. (2011). Phytochemical analysis of some medicinal plants. Journal of Phytology, 3(12).
51. Yedjou, C. G., Njiki, S., Enow, J., Ikome, O., Latinwo, L., Long, R., . . . and Tchounwou, P. B. (2021). Pharmacological effects of selected medicinal plants and vitamins against COVID-19. Journal of Food and Nutrition, 7(2). doi:10.17303/jfn.2021.7.202
52. Zhang, L., Ravipati, A. S., Koyyalamudi, S. R., Jeong, S. C., Reddy, N., Bartlett, J., . . . and Vicente, F. (2013). Anti-fungal and anti-bacterial activities of ethanol extracts of selected traditional Chinese medicinal herbs. Asian Pacific Journal of Tropical Medicine, 6(9), 673–681. doi:10.1016/S1995-7645(13)60117-0

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