

Natural products from medicinal plants in Asia and the Pacific for RNA viruses: Hercules' fifth labour

ABSTRACT

Context: The emergence of zoonotic viruses in the last decades culminating with COVID-19 and challenges posed by the resistance of RNA viruses to antiviral drugs requires the development of new antiviral drugs. Objective: This review identifies natural products isolated from Asian and Pacific medicinal plants with in vitro and in vivo antiviral activity towards RNA viruses and analyses their distribution, molecular weights, solubility and modes of action. Materials and methods: All data in this review was compiled from Google Scholar, PubMed, Science Direct, Web of Science, ChemSpider, PubChem and library search from 1961 to 2022. Results: Out of about 350 molecules identified, 43 phenolics, 31 alkaloids, and 28 terpenes were very strongly active against at least one type of RNA virus. These natural products are mainly planar and amphiphilic, with a molecular mass between 200 and 400 g/mol and target viral genome replication. Hydroxytyrosol, silvestrol, lycorine, tylophorine and 12-O-tetradecanoylphorbol 13-acetate with IC₅₀ below 0.01 mg/mL and selectivity index (S.I.) above 100 have the potential to be used for the development of anti-RNA virus leads. Discussion and conclusions: The medicinal plants of Asia and the Pacific are a rich source of natural products with the potential to be developed as lead for the treatment of RNA viral infections.