

Yellow Necklacepod and Shih-Balady: Possible Promising Sources Against Human Coronaviruses

Authors : Howaida I. Abd-Alla, Omnia Kutkat, Yassmin Moatasim, Magda T. Ibrahim, Marwa A. Mostafa, Mohamed GabAllah, Mounir M. El-Safty

Abstract : *Artemisia judaica* (known shih-balady), *Azadirachta indica* and *Sophora tomentosa* (known yellow necklace pod) are members of available medicinal plants well-known for their traditional medical use in Egypt which suggests that they probably harbor broad-spectrum antiviral, immunostimulatory and anti-inflammatory functions. Their ethyl acetate-dichloromethane (1:1, v/v) extracts were evaluated for the potential anti-Middle East respiratory syndrome-related coronavirus (anti-MERS-CoV) activity. Their cytotoxic activity was tested in Vero-E6 cells using 3-(4,-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) method with minor modification. The plot of percentage cytotoxicity for each extract concentration has calculated the concentration which exhibited 50% cytotoxic concentration (TC50). A plaque reduction assay was employed using safe dose of extract to evaluate its effect on virus propagation. The highest inhibition percentage was recorded for the yellow necklace pod, followed by Shih-balady. The possible mode of action of virus inhibition was studied at three different levels viral replication, viral adsorption and virucidal activity. The necklace pod leaves have induced virucidal effects and direct effects on the replication of virus. Phytochemical investigation of the promising necklace pod led to the isolation and structure determination of nine compounds. The structure of each compound was determined by a variety of spectroscopic methods. Compounds 4-O-methyl sorbitol 1, 8-methoxy daidzin 6 and 6-methoxy apigenin-7-O- β -D-glucopyranoside 8 were isolated for the first time from the *Sophora* genus and the other six compounds were the first time that they were isolated from this species according to available works of literature. Generally, the highest anti-CoV 2 activity of *S. tomentosa* was associated with the crude ethanolic extract, indicating the possibility of synergy among the antiviral phytochemical constituents (1-9).

Keywords : coronavirus, MERS-CoV, mode of action, necklace pod, shih-balady

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