

The Tannins and Related Biological Activities from *Eugenia uniflora* L.

(*Eugenia uniflora* L.)

Epstein-Barr virus (EBV) DNA polymerase

(Myrtaceae)

(*Antidesma pentandrum* var. *barbatum*)[Euphorbiaceae]

(dimer)

antidesmin A

(HPLC)

70 acetone

6

eugeniflorins D1, D2,

oenothain B, 1,2,4,6-tetra-O-galloyl- β -D-glucose, gallocatechin

ellagic acid

eugeniflorins D1, D2

KB cells, Hep3B cells

DNA RNA

EB DNA polymerase

eugeniflorin D2

oenothain B

KB

IC50

39.43 μ g / ml

21.50 μ g / ml

Hep3B

IC50

75.28 μ g / ml

77.12 μ g / ml

Hep3B

DNA RNA

RNA

EBV DNA polymerase

eugeniflorins D1, D2

IC50

5.2 μ g / ml

5.5 μ g / ml

There are two parts in the present study. The first part is a study on new compounds of tannins derived from *Eugenia uniflora* L. and the second part on the biological activities of tannins originated from *E. uniflora* in view of the mechanism of cell cytotoxicity and the inhibition of EBV DNA polymerase. The

plants of Taiwan is very plentiful. Recently, tannins are well known to show a significant effect on antitumor, antiviral and antioxidative activities. In the present study, chemical methods (FeCl_3 T.S., NaNO_2 -AcOH etc.) were used to screen polyphenolic compounds from different families (i.e. Euphorbiaceae, Leguminosae, Lythraceae and Myrtaceae, etc.) which contained abundant tannins. Subsequently, by the analysis of HPLC, the identification was based on the reference component, antidesmin A (dimeric hydrolysable tannin), derived from *Antidesma pentandrum* var. *barbatum* Merr. in our laboratory. After isolation of the 70% acetone extract of dried leaves from *E. uniflora*, six compounds, eugeniflorins D1, D2, oenothein B, 1,2,4,6-tetra-O-galloyl- β -D-glucose, galocatechin and ellagic acid, were obtained. Eugeniflorins D1 and D2, new hydrolysable tannins dimers, were firstly found in the natural plants. The KB and Hep3B cells were employed in vitro to study the cell cytotoxic effects of the tannins derived from *E. uniflora*. The cytotoxicity of these cell lines were studied by the treatment of eugeniflorin D2 and oenothein B through the examination of both scanning and transmission electron microscopies. In the present study, the biosynthesis of DNA, RNA and protein were analyzed by radioactive incorporation. The EBV DNA polymerase associated with nasopharyngeal carcinoma was further utilized as an index to survey the active components of tannins. Putting the data together, the present results demonstrated that both eugeniflorin D2 and oenothein B showed an evident cytotoxic effect on treated cells (for KB cells, IC_{50} = 39.43 μg / ml and 21.50 μg / ml, respectively; for Hep3B cells, IC_{50} =75.28 μg / ml and 77.12 μg / ml, respectively). They also inhibited the biosynthesis of DNA, RNA and protein of Hep3B cells, particularly, those of the latter two were significantly obstructed. In addition, eugeniflorin D1 and eugeniflorin D2 would obviously restrain the activity of EBV DNA polymerase (IC_{50} =5.2 μg / ml and 5.5 μg / ml, respectively).