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Antiviral effect of two polyphenol-enriched plant extracts against herpes simplex virus type 1

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Polyphenol-enriched plant extracts from *Myrothamnus flabellifolia* Welw. (Myrothamnaceae) and *S.R.* (Polygonaceae) standardized on oligomeric and polymeric proanthocyanidins were tested for antiviral activity against herpes simplex virus type 1 (HSV-1) in vitro using plaque reduction assay and MTT assay.

Both extracts inhibited HSV-1 replication in a dose-dependent manner. IC_{50} values, as determined by MTT assay on Vero cells were 0.3 $\mu\text{g}/\text{mL}$ for *M. flabellifolia* and 0.4 $\mu\text{g}/\text{mL}$ for *S.R.* Respective CC_{50} values were calculated with 50.1 $\mu\text{g}/\text{mL}$ and 45.2 $\mu\text{g}/\text{mL}$, indicating a CC_{50}/IC_{50} ratio of 167 and 113. The antiviral activities were confirmed by plaque reduction assay.

To determine the mechanism of these antiviral effects, both extracts were added at different stages during the viral replication cycle. The strongest antiviral activity in MTT assay was observed when extracts were added before attachment of HSV-1 to Vero cells. In an adsorption assay it could be clearly verified that the attachment of virus to cells was inhibited. Therefore the effect of test extracts on HSV-1 membrane proteins was investigated. In immunoblot experiments a significant interaction between the gD protein and the compounds of *M. flabellifolia* and *S.R.* extract became apparent. Thus both extracts are assessed as strong inhibitors of virus attachment to the host cell due to interaction of the proanthocyanidins with virus surface proteins.

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