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SIRIPEN JARIKASEM : A PHYTOCHEMICAL STUDY ON ANTI-HERPES SIMPLEX COMPONENTS FROM *GYNURA PROCUMBENS* MERR.  
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*Gynura procumbens* Merr. (Asteraceae), has been used traditionally as an anti-inflammatory remedy for skin rash and itching. There has also been a claim for antiherpes viral action of the *Gynura* plant. The purpose of this research was to analyze this plant to verify the possible existence of antiherpes viral components. The antiviral assay guided fractionation of plant extract was established. The aerial plant powder was successively extracted using petroleum ether (40-60°C), chloroform and 95% ethanol. The ethanolic extract showed the antiviral activity against herpes simplex virus type 1 and herpes simplex virus type 2. The plaque reduction assay guided fractionation of the ethanolic extract was performed. Activity was observed for the water-methanol 1:1 (Fr.2), the methanol (Fr.3) and ethyl acetate fraction (Fr.4). The chemical constituents in Fr.2 and Fr.3 were investigated. The structure elucidation of the plant compounds was achieved using spectroscopic methods, especially modern NMR with field gradient techniques.

Phenolic compounds from Fr.2 (water-methanol 1:1) were isolated and identified. They were kaempferol-3-O- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranoside, kaempferol-3-O- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 6)- $\beta$ -D-galactopyranoside, 3-O- $\beta$ -D-glucopyranosyl-5,7,4'-trihydroxyflavone and 3-O- $\beta$ -D-glucopyranosyl-5,7,3',4'-tetrahydroxyflavone. Caffeoylquinic acid derivatives were also isolated from Fr.2. They were 5-O-caffeoyl-D-quinic acid (chlorogenic acid), 3,5-di-O-caffeoylquinic acid and 4,5-di-O-caffeoylquinic acid. A mixture of 3,5-di-O-caffeoylquinic acid and 4,5-di-O-caffeoylquinic acid was proved for the virucidal activity against HSV-2 with IC<sub>50</sub> 96.0  $\mu$ g/ml and antireplicative activity against HSV-2 with IC<sub>50</sub> 61.0  $\mu$ g/ml. It was the first time to verify the antiherpes viral activity of di-O-caffeoylquinic acid from *Gynura procumbens*.

The compounds isolated from Fr.3 (methanol) were identified as 3,5,7,4'-tetrahydroxyflavone (kaempferol), a mixture of 3-O- $\beta$ -D-glucopyranosyl-22E-(24S)-(24 $\alpha$ )-ethylcholest-5,22-diene (stigmasteryl-3-O- $\beta$ -D-glucopyranoside) and 3-O- $\beta$ -D-glucopyranosyl-(24S)-(24 $\alpha$ )-ethylcholest-5-ene (sitosteryl-3-O- $\beta$ -D-glucopyranoside) in the ratio of 40:60, respectively and a mixture of (22E,24S)-(24 $\alpha$ )-ethylcholest-5,22-diene-3- $\beta$ -ol (stigmasterol) and (24S)-(24 $\alpha$ )-ethylcholest-5-ene-3- $\beta$ -ol (dihydrostigmasterol = sitosterol) in the ratio of 70:30, respectively. In addition, glycerolipids were also isolated and identified. They were 1,2-bis-dodecanoyl-3- $\alpha$ -glucopyranosyl-*sn*-glycerol (monoglucosyl diglyceride) and 1-(1',5'-dihydroxy-docosanyl)-2-(2''-hydroxy-tetracosanamide)-*sn*-glycerol. These glycerolipids have never been identified before this research. The antiviral activity shown in this study suggests that *Gynura procumbens* possesses useful compounds in the treatment of herpes viral infections and the phytopharmaceutical development should be done.