Inhibition of Proinflammatory Cytokine Release by Flavones and Flavanones from the Leaves of Dracaena steudneri Engl.

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**Abstract**

The leaves of Dracaena steudneri yielded 6 new flavonoids–3,5,7-trihydroxy-6-methyl-3′,4′-methylenedioxyflavone (1), 5,7-dihydroxy-3-methoxy-6-methyl-3′,4′-methylenedioxyflavone (2), 3,5,7-trihydroxy-6-methoxy-3′,4′-methylenedioxyflavone (3), (2S,3S)-3,7-dihydroxy-6-methoxy-3′,4′-methylenedioxyflavanone (4), 4′,5,7-trihydroxy-3,3′,8-trimethoxy-6-methylflavone (5), (2R) 7-hydroxy-2′,8-dimethoxyflavanone (6)–together with 13 known congeners. Their structures were established using spectroscopic and spectrometric methods including NMR, CD, and HRMSn measurements. The compounds were evaluated for their anti-inflammatory potential through measurement of the levels of cytokines IL-1β, IL-2, GM-CSF, and TNF-α in the supernatant of human peripheral blood mononuclear cells stimulated by lipopolysaccharide. Flavones derivatives 1–4 with a C-3′/4′ methylenedioxy substituent led to a substantial increase in the production of IL-1β and GM-CSF out of 4 pro-inflammatory cytokines relative to LPS control. Quercetin derivatives 5, 11, and 13 with a hydroxyl group at C-4′ inhibited the production of IL-2, GM-CSF, and TNF-α. The presence of a C-2/C-3 double bond in 14 was pivotal to the significantly stronger (0.4 to 27.5% of LPS control) inhibitory effect compared to its dihydro derivative 8 (36.2 to 262.7% of LPS control) against all tested cytokines. It is important to note that the inhibitory activity of 14 was substantially higher than that of the standard drug used, ibuprofen.

**Key words**

Dracaena steudneri - Asparagaceae - flavonoids - anti-inflammatory effects - flavones - flavanones