



Novel Fatty Acid Synthase Inhibitors from the Vines of *Polygonum multiflorum* Thunb.

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SUMMARY. Fatty acid synthase is a multifunctional homodimeric enzyme protein, and is the key enzyme required for the anabolic conversion of dietary carbohydrates to fatty acids. Fatty acid synthase synthesizes long-chain fatty acids by using acetyl-CoA as a primer, malonyl-CoA as a 2 carbon donor, and nicotinamide adenine dinucleotide phosphate for reduction. Now this enzyme is considered as a novel drug target for the development of anti-obesity and anti-cancer agents. The chemical investigation of the vines of *Polygonum multiflorum* Thunb. resulted in the isolation of nine phenolic compounds, in which compound 2,5-dimethyl-7-hydroxychromone was isolated for the first time from this species. All these compounds were evaluated for inhibitory activities of fatty acid synthase. Among them, 2,5-dimethyl-7-hydroxychromone, emodin, torachryson-8-O- β -D-glucopyranoside, emodin-8-O- β -D-glucopyranoside, and 2,3,5,4'-tetrahydroxystilbene-2-O- β -D-glucopyranoside presented significant activity of fatty acid synthase inhibition with half inhibitory concentration values of 32.4, 34.1, 51.8, 13.8, and 35.2 μ M, respectively.

RESUMEN. La ácido graso sintasa es una proteína enzimática homodimérica multifuncional, y es la enzima clave requerida para la conversión anabólico de carbohidratos de la dieta a ácidos grasos. La ácido graso sintasa sintetiza ácidos grasos de cadena larga mediante el uso de la acetil-CoA como cebador, la malonil-CoA como donador de carbono 2, y la nicotinamida adenina dinucleótido fosfato para la reducción. Ahora bien, esta enzima se considera como una diana de fármaco novedoso para el desarrollo de agentes anti-obesidad y anti-cáncer. La investigación química de los tallos de *Polygonum multiflorum* Thunb. dio como resultado el aislamiento de nueve compuestos fenólicos, en la que se aisló el compuesto 2,5-dimetil-7-hydroxychromona por primera vez a partir de esta especie. Todos estos compuestos se evaluaron para las actividades inhibitoras de la sintasa de ácidos grasos. Entre ellos, 2,5-dimetil-7-hydroxychromona, emodina, torachrysona-8-O- β -D-glucopiranosido, emodina-8-O- β -D-glucopiranosido y 2,3,5,4'-tetrahydroxystilbeno-2-O- β -D-glucopiranosido presentan una actividad significativa de la inhibición de la sintasa de ácidos grasos con valores medios de concentración inhibitora de 32,4, 34,1, 51,8, 13,8 y 35,2 mM, respectivamente.

KEY WORDS: anthraquinones, fatty acid synthase, inhibitor, phenolic compounds, *Polygonum multiflorum*.

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