Anti-inflammatory and anti-melanogenic steroidal saponin glycosides from Fenugreek (Trigonella foenum-graecum L.) seeds.

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Abstract

Fenugreek seed (Trigonella foenum-graecum L.) is used as an herbal medicine for treating metabolic and nutritive dysfunctions. To determine if this plant has other beneficial effects, we tested the inhibitory activities of a methanol (MeOH) extract of fenugreek seed on the production of inflammatory cytokines and melanin synthesis in cultured cell lines in vitro. The MeOH extract inhibited the production of phorbol-12-myristate-13-acetate-induced inflammatory cytokines such as tumor necrosis factor (TNF)-α in cultured THP-1 cells, and also restrained the intracellular synthesis of melanin in murine melanoma B16F1 cells. We isolated three active constituents from fenugreek seed extracts. These were identified as the steroidal saponins 26-O-β-D-glucopyranosyl-(25 R)-furost-5(6)-en-3 β,22 β,26-triol-3- O-α-L-rhamno-pyranosyl-(1" → 2')-O-[β-D-glucopyranosyl-(1" → 6')- O]-β-D-glucopyranoside 1, minutoside B 2, and pseudoprotodioscin 3. Compounds 1 and 2 strongly suppressed the production of inflammatory cytokines, whereas 3 showed a weaker suppressing effect. Melanogenesis in B16F1 cells was significantly suppressed by 1 and 3, and weakly suppressed by 2. All three compounds showed moderate cytotoxicities. These results indicate that fenugreek extract and its active constituents could protect against skin damage.

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