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Screening of Biological Activities in accessions of Sorghums

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Sorghum [*Sorghum bicolor* (L.) Moench] is the fifth leading cereal crop in the world and is used primarily in Asia and Africa as a food crop. However, sorghum uses mainly as a feed grain. More recently, several additional potential health and pharmaceutical benefits of sorghum have been reported. These include slow digestibility, cholesterol lowering, cardiovascular disease reduction, and anticarcinogenic properties. Sorghum phenols protect plants against insects and diseases and they can also act as antioxidants in *vitro*. In this report, antioxidant activity by DPPH method and antimicrobial activity by two-fold dilution assay were analyzed in root, stem, leaf and seed of 26 varieties sorghum. 3 of 26 veriaties sorghum were extracted with methanol and then further fractioned to *n*-hexane, ethyl-acetate, *n*-buthanol, and water from methanol extracts. In addition, phenol compounds were analyzed in seed by HPLC. Almost all sorghum showed higher antioxidant activity except Kkachisusu, Kkachisusu(daerip) <RC50: 130㎍/㎖, 62㎍/㎖>. Especially, Geomeunchal susu, Jangsu susu showed very high efficiency <RC50: 4㎍/㎖>. The butanol and water soluble fractions showed greater efficiency in antioxidant activity than *n*-hexane, ethyl acetate. In sorghum, catechin, chlorogenic acid, salicylic acid, myricetin are main the phenol compounds. Whereas, Bulkeunchal susu, Bulkeunjangsu susu, Bulkeunjangmok susu showed higher contents of total phenolic compounds.

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Isolation and Purification of Lipase Inhibitor from herbs

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In order to develop a functional food and anti-obesity drug through the inhibition of absorption of dietary lipids, we investigated the inhibitory effects on pancreatic lipase of extracts from more than 800 species of herbs in Korea. In this study, we isolated inhibitor (licochalcone A) from ethyl acetate extract of the roots of Glycyrrihiza uralensis. Its structure was elucidated by ^{1}H-NMR, ^{13}C-NMR and HR-EI mass spectroscopy. Purified inhibitor substantially inhibited activity with IC_{50} value of 35 μg/mL (103.4 μM). And its inhibition mode was a non-competitive inhibitor, determined by Lineweaver-Burk plot analysis, and Ki value was 11.2 μg/mL (32.8 μM). Furthermore, licochalcone A significantly reduced the productioin of oleic acid with not only DNPB as an artificial substrate but also triolein as a natural substrate by pancreatic lipase.