**Anti-ulcer and anti-adipogenesis effect of anthocyanins from *Rubus coreanus*.**

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Anthocyanins are natural pigments in various materials. In general, anthocyanins have important metabolic functions in animals including protection against various diseases such as ulcer and cancer by scavenging oxygen radicals. In this study, the functions of anthocyanins against stomach ulcer and obesity have investigated. Ulcerative lesions of the gastrointestinal tract are usually induced by various environmental factors. Among them, one of the major cause is related with oxidative stress. In this study, gastric ulcer has been induced by naproxen in rat model. And, improvement of stomach ulcer has been monitored by treatment with anthocyanins from *rubus coreanus*. Anthocyanins exhibit possible anti-ulcer activity in acute ulcer in rat model by preventing lipid peroxidation, and significant increase in the activities of antioxidant proteins such as catalase, superoxide dismutase, and glutathione peroxidase. Specially, anthocyanins have improved the cellular defense system against oxidative stress by regulation of nuclear erythroid factor 2 (NE-F2)-related factor 2 (Nrf2). Meanwhile, anti-obesity effect of anthocyanins was investigated by using a 3T3-L1 preadipocyte cells. Anthocyanins have inhibited expression of the key adipogenic transcription factors such as CCAA/enhancer binding protein-alpha (C/EBP-α) and peroxisome proliferator-activated receptors-gamma (PPAR-γ). Also, anthocyanins have inhibited expression of Nrf2. Chromatin immunoprecipitation studies show that Nrf2 associates with consensus binding sites for Nrf2 in the PPARγ promoter. Anthocyanins have attenuated the adipogenesis by inhibition of the Nrf2 binding with regions of PPARγ promoter. Overall, anthocyanins may play an important role in anti-ulcer and anti-adipogenic activity via regulation of Nrf2 activation.