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Extraction, phytochemical profile and bioaccessibility of *Echinocactus grusonii*

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The phytochemical properties of 3-year-old golden barrel cactus extracts compared with 6-year-old are studied. In addition, the antioxidant activities, cytotoxicity, *in vitro* digestion stability, including the cellular uptake of golden barrel extracts are investigated. The phytochemical analyses of both cactus extracts revealed the presence of lutein, chlorophyll a, chlorophyll b, pheophytin a, pheophytin b and phenolic compounds. The 3-year-old cactus extracts showed the IC₅₀ values of 112.60 and 44.62 mg raw material (RM)/ml, while the 6-year-old showed 191.90 and 81.84 mg RM/ml for DPPH and ABTS assay, respectively. In addition, their antioxidant activities by FRAP assay showed value at 0.014 and 0.01 mmol Fe²⁺/g RM for 3- and 6-year-old extracts, respectively. Cytotoxicity of extracts before and after *in vitro* digestion exhibited extremely high value of LC₅₀ (>200 µg RM/ml) against Caco-2 and HepG2 cells indicating the non-toxic activity. The digestive stability of lutein, chlorophylls and phenolic compounds of 3- and 6-year-old extracts was 69.03%, 37.64%, 60.52% and 58.33%, 33.34% and 56.89%, respectively. Additionally, the lutein, chlorophylls and phenolics from 3- and 6-year-old cactus extracts were uptaken by Caco-2 cells at the level of 30.63%, 36.88%, 28.27% and 26.31%, 28.10% and 25.11%, respectively. Finally, the investigations of cellular lutein and phenolics transport in Caco-2 cells were 8.05%, 9.18% and 7.67%, 6.95% for 3- and 6-year-old cactus extracts, respectively. In conclusion, phytochemical content and bioactivities of 3-year-old extracts being higher than that of 6-year-old extracts indicated the importance of plant maturity. Lutein, total chlorophylls, total phenolic and antioxidant activity of the 3-year-old extracts were higher than that of 6-year-old extracts indicated that these compounds were not stable during simulated gastric and small intestinal digestion. Finally, lutein and total phenolic compounds from golden barrel cactus extracts could be absorbed and transported through Caco-2 cells, but chlorophylls did not detected in the transport process.

Biography

Ratchadaporn Oonsivilai has her expertise in phytochemical profiling and bioactivities in functional food. Her research work focus on Thai medicinal plants which composed of bioactive ingredients. She identified the bioactive compound by phytochemical profiling both in chlorophylls and phenolic profiles. *In vitro* and *in vivo* assay carried out to evaluate the bioactivities of bioactive compound or the crude plant extracts.

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