Anti-aging and DNA repair effects of *Echinacea purpurea* extracts from Taiwan

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**ABSTRACT**

*Echinacea* spp. has been widely used as herbal medicine and botanical supplement in North America and Europe. It is safe and effective in prevention of common cold, upper respiratory and urinary tract infections. The Taichung District Agricultural Research and Extension Station in Taiwan imported seeds from Canada had planted *Echinacea purpurea* successfully. Taiwan Direct Biotechnology Co., Ltd. has developed *Echinacea* compound such as Flothy® *Echinacea* Tonic for baby (EP-B) and *Echinacea* healthy Tonic for adult (EP). The marker compounds of Taiwan cultured Echinacea are comparable with those of North American origin by HPLC analysis. We used standard extract, Echinaforce® by A. Vogel (EF) and Echinacin® Liquidum (EL) and Echinacin® Saft (ES) by Madaus as positive controls to compare their anti-oxidant effect. We found that Flothy® products have excellent activity on free radical scavenging and DNA protection. In addition, using senescence associated \(\beta\)-galatosidase assay, we found that our *Echinacea purpurea* extracts and Flothy® *Echinacea* Tonic can reduce \(H_2O_2\)-induced cellular senescence. Using host cell reactivation of nucleotide excision repair assay, we found that *Echinacea purpurea* extract increased DNA repair ability in H1299 cells compared to vehicle control. The successful agriculture products of *Echinacea purpurea* imported to Taiwan have been widely accepted as health-care supplement. They can also be used as alternative anti-aging herbal medicine. The mechanism of anti-oxidant, anti-senescence and DNA repair enhancement are under investigation.

**Keywords:** *Echinacea purpurea*, anti-oxidant, anti-aging, DNA repair