

[P3-34]**Gromwell is a prominent dietary source of γ -linoleic acid for reversing epidermal hyperproliferation of guinea pigs**

Juyoung Kim¹, HyunAe Kim¹, Dohyeon Jeong³, Sunghan Kim³, Seongkyu Park² and Yunhi Cho¹

Department of Medical Nutrition, Graduate School of East-West Medical Science¹, Department of Prescriptionology, College of Oriental Medicine², Kyung Hee University, Seoul, Korea. NUTREX Co. Ltd.³ Seoul, Korea.

As a nutritional supplement, γ -linolenic acid [GLA : 18 : 3(n-6)] has been reported to be efficacious in the management of hyperproliferative disorders of skin. This beneficial effect of GLA is caused by its 15-lipoxygenase metabolite, 15-hydroxyeicosatrienoic acid (15-HETrE), exerting antiproliferative bioactivity in skin. A high concentration of GLA in plant source was reported for borage oil (BO; *Borago officinalis*), which contains 24-25g/100g GLA and in black currant oil (BCO; *Ribes nigrum*), which has 16-17g/100g GLA. Recently, the similar level of GLA has been found in Gromwell (*Lithospermum erythrorhizon* Sieb, et Zucc) which has been used for treating skin disorders in oriental medicine. To compare the antiproliferative effect of BO, BCO and Gromwell, epidermal hyperproliferation was induced in guinea pigs by hydrogenated coconut oil (HCO) diet 8 wk. Subsequently, guinea pigs were fed diets of borage oil (group HBO), black currant oil (group HBCO), water extract of Gromwell (group GW) or organic extract of Gromwell (group GO) for 2 wk. As controls, three groups were fed BO, BCO or HCO for 10 wk. Epidermal hyperproliferation was reversed in groups GO and HBO, both by decreasing the transepidermal water loss (TEWL) and the expression of Ki-67 (a biomarker of cell proliferation) to the similar level of normal control group BO. However, epidermal hyperproliferation was not reversed in groups GW and HBCO. The accumulations of dihomo- γ -linolenic acid [DGLA : 20 : 3(n-6)], an elongase product of GLA into total lipids and of 15-HETrE in the epidermis of group GO were greater than of group HBO. In addition, group GO had a higher level of ceramides, the major lipids maintaining epidermal barrier. Taken together, our data demonstrate that organic extract of Gromwell is a prominent dietary source of γ -linoleic acid than borage oil in reversing epidermal hyperproliferation with higher accumulations of DGLA, 15-HETrE and ceramides in the epidermis of guinea pigs.