

보였다. 잎 하부에서는 oxalic acid가 3576.58 mg/100g 으로 가장 높은 함량을 나타내었고 뿌리에는 유기산의 함량이 적은 것으로 나타났다. Tartaric acid와 lactic acid는 62.77 mg/100g, 41.55 mg/100g이 잎 상부에만 포함된 것으로 나타나 유기산은 창포의 부위별로 큰 차이가 있음을 알 수 있었다. 지방산은 palmitic acid, eicosadienoic acid, linolenic acid, linoleic acid가 높은 함량을 나타냈는데 linoleic acid는 37.64%로 잎 하부에서, eicosadienoic acid는 40.78%로 뿌리에서 높은 함량을 나타내었으나 대부분의 지방산이 잎 상부가 높은 함량을 나타냄을 확인 할 수 있었다. 아미노산은 aspartic acid, glutamic acid가 전반적으로 높은 함량을 보였는데 잎 상부에서 913.20 mg/100g, 1481.15 mg/100g으로 높은 함량을 나타내었다. 이 실험을 통하여 잎 상부의 이용 가능성을 확인 할 수 있었고 이에 관한 연구가 더욱 진행 되어야 할 것으로 사료된다.

### P3-3

#### Morphological and crystalline properties of lotus root starches

(*Nelumbo nucifera* Gaertn, *Nelumbo lutea* Pers.) granule by acid hydrolysis

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Acid modification is widely used in the starch industry to produce acid-thinned starch for use in food industry. Effect of acid hydrolysis on the morphological, particle size distribution and crystalline properties of starches were investigated. In this study, starches isolated from two cultivars of lotus root (*Nelumbo nucifera* Gaertn, *Nelumbo lutea* Pers.) were subjected to acid hydrolysis for 2, 4, 8, 16 and 32 days. The acid-thinned starch were evaluated for starch yield, Muan-Bak Ryeon starch yield reduced from 100% for unmodified to 52.18% for starch subjected to 32 days of acid hydrolysis, 51.96% for Hoong Ryeon starch. The SEM results revealed that the hydrogen ion preferentially attacked the outer crystalline area of the starch granules. Some fissures on the surface of acid-thinned starch granules were observed when starch subjected to 8 days of acid hydrolysis. The average particle size of Muan-Bak Ryeon starch was decreased from 38.97 $\mu$ m for unmodified starch to 26.61 $\mu$ m for acid-thinned starch for 32 days, particle size of Hoong Ryeon starch was decreased from 37.75 $\mu$ m for unmodified starch to 26.31 $\mu$ m. X-ray diffraction pattern of both unmodified starch were demonstrated as C-type and present in A-type starch when degraded in the process of hydrolysis. The gelatinization, gel and rheological properties and some physicochemical properties of acid hydrolysis lotus root starches were not included in this study.