Sikaret Kongkaew. 2014: Effects of Sugars on Lipid Changes in Ground Perilla (*Perilla frutescens* L.) Seed. Master of Science (Home Economics), Major Field: Home Economics, Department of Home Economics. Thesis Advisor: Miss Siriporn Riebroy, Ph.D. 140 pages.

Chemical composition, bioactive compounds and antioxidant activities of brown perilla and white perilla seeds were comparatively studied. Brown perilla seed had higher protein, fat and ash contents than those of white perilla seed (p<0.05). Additonally, brown perilla seed had greater Ca, Mg, and P contents than those of white perilla seed (p<0.05). Brown perilla seed was rich in polyunsaturated fatty acid, in particular γ-linolenic acid and α-linolenic acid. Higher total phenolic, total flavonoid, and total flavonol contents were observed in brown perilla seed (p<0.05), which might correlate with higher 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis (3-ethylbenzthiazoline-6-sulphonic acid) (ABTS)-radical scavenging activities as well as ferric reducing antioxidant power and reducing power. From these results, brown perilla seed was selected for further study. In addition, chemical and physical properties of seven commercial sugars (cane sugar paste; S1, unrefined cane sugar; S2, brown cane sugar; S3, caramel crystal cane sugar; S4, refined white crystal cane sugar; S5, coconut sugar paste; S6 and palm sugar paste; S7) were also investigated. All commercial sugars showed slightly differences in pH, A_w, and total sugar content. S1 had the highest reducing sugar content, intermediate (OD_{285}) and browning (OD_{420}) products, as well as total phenolic content (p<0.05). However, DPPH-radical scavenging activity of S1, S3, S6 and S7 were higher than other samples. These sugars were chosen for study on lipid changes in ground perilla seed during 30-day storage at room temperature. A decrease in pH and A_w of ground perilla seed added with four different sugars were observed during storage (p<0.05). Generally, changes in L*, a* and b* of all samples were found throughout the storage. Free fatty acid increased with increasing storage time and the rate of increase was more pronounced in sample added with S7 (p<0.05). During storage, peroxide value, conjugated diene and thiobarbituric acid reactive substances (TBARS) of all samples decreased. This was postulated to be due to the loss of volatile oxidation compounds from samples stored for longer time. Lower acceptance in all attributes (appearance, color, odor, taste, sweet, texture, flavor and overall liking) was observed in sample added with S3, than in other samples, particularly when storage time increased (p<0.05). However, sample added with S1, S6, and S7 showed slight decreases in overall liking scores within 20 days. The results revealed that sugars paste, especially coconut sugar paste can be used to retard the lipid oxidation in ground perilla seed products.

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Student's signature Thesis Advisor's signature

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