Pichamon Sawangsuk 2008: Effect of Processing on Free and Glycosidically-Bound Aroma Active Compounds in Lemongrass (*Cymbopogon citratus* (DC.) Stapf). Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Wannee Jirapakkul, Ph.D. 105 pages.

Lemongrass (*Cymbopogon citratus* (DC.) Stapf) is widely used as an essential ingredient in Thai cuisine. Volatile compounds of lemongrass present in both free and glycosidically-bound forms. The odorless glycosidically-bound volatile compound could be hydrolyzed into free form by natural enzyme or heating processes. The objectives of this study were to identify and compare the free and glycosidically-bound aroma active compounds of lemongrass from 4 products: lemongrass in water, lemongrass in water covered on the top with oil, oven dried lemongrass and freeze dried lemongrass. Free and glycosidically-bound volatile compounds were extracted from lemongrass by solvent. The glycosidically-bound volatile compounds were liberated by acid hydrolysis. Identification and quantification of volatile compounds were performed by gas chromatography (GC) and aroma active compounds were studied by gas chromatography-olfactometry (GC-O). The major free volatile compounds of lemongrass were geranial and neral. The other important compounds were β-myrcene, geranyl acetate, *(E)*-geraniol, *(E)*-β-caryophyllene, calarene and α-farnesene. The major glycosidically-bound volatile compounds of lemongrass were geranial, neral, calarene, geranyl acetate, *(E)*-geraniol and citronellol. The concentration of free volatile compounds of fresh lemongrass was higher than glycosidically-bound forms. For the study of aroma active compounds of lemongrass by aroma extraction dilution analysis (AEDA), *(Z)*-β-ocimene, *l*-linalool, neral, *(E)*-geraniol, geranial, α-gurjunene, *(E)*-β-caryophyllene, *endo*-1-bourbonanol and calarene had the highest $\log_3$ FD factor values. Those compounds showed odor characteristic of lemongrass such as lemon-like, sweet, fresh and cool odors. However, the amounts of aroma active compounds were reduced in all processed samples. The concentration of major free aroma active compounds of oven dried lemongrass was similar to those of fresh one. The high reductions in the free aroma active compounds were found in lemongrass in water, freezed dried and lemongrass in water covered on the top with oil, respectively. Lemongrass in water and lemongrass in water covered on the top with oil had bug-like, oily and roast odors from *(E)*-pinocarvyl acetate, *(E)*-α-bergamotene, *(E)*-β-farnesene, *(E,E)*-farnesal and T-cadinol. Glycosidically-bound aroma compounds in processed lemongrass were lower than in the fresh. The most reductions of glycosidically-bound aroma active compounds were in oven dried lemongrass, freeze dried lemongrass, lemongrass in water and lemongrass in water covered on the top with oil, respectively.

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