**ABSTRACT**

The flavor of food plays a main role in consumer acceptability. To achieve this acceptability, research on food flavor has been conducted. Various studies have reported on the volatile flavor compounds of soy sauce from different origins. These include Japanese soy sauce, Korean soy sauce, and Indonesian soy sauce. However, this information did not completely represent the character of Thai soy sauce due to the variations in ingredients and processing conditions.

A comparative study of sample preparation techniques of a Thai soy sauce sample was performed based on gas chromatography-mass spectrometry (GC-MS) analysis. The techniques employed were dynamic headspace (DHS) sampling, direct solvent extraction (DSE), and vacuum simultaneous distillation-solvent extraction (V-SDE). In total, ninety-three compounds were detected in soy sauce NC I and soy sauce YW I. They could be categorized in the chemical classes of acids, alcohols, aldehydes, ester, furan, furanone, ketone, pyrazine, pyrone, sulfur-containing compounds, and miscellaneous compounds. Some similarities were observed among different sample preparation techniques. Highly volatile compounds were only detected by DHS whereas DSE and V-SDE gave wide spectra of chemical classes detected. Moreover, differences of volatile compounds detected in both soy sauce samples were noted.

The correlation between volatile compounds and protein content or total acid was investigated in twenty-two Thai soy sauce samples. Volatile compounds were referred to both in ethanol concentration and volatiles obtained from DHS analysis. High linear correlation between volatile and ethanol concentration ($R^2 = 0.8273$) was observed. These results implied that high content of volatiles in the product might be due to active yeast fermentation.

The concentration of purgable volatiles, which were responsible for top note aroma, were determined in soy sauce NC I and soy sauce SC I. The concentration of purgable volatiles was calculated in the range of 10 to 12000 ng/g. In this research, the odor activity value (OAV) concept was applied to determine odor active compounds in Thai soy sauce. The most potent odorants were estimated to be dimethyl sulfide and 3-methyl butanal in soy sauce NC I and soy sauce SC I, respectively.

In storage test, two Thai soy sauce samples were kept in glass bottles and stored at four different temperatures (25, 35, 45, and 55 °C) under headspace or without headspace. Increasing volatile Maillard products as well as browning development during storage were observed. The results indicated that the qualities of Thai soy sauce during storage were greatly affected by the headspace oxygen and storage temperature.

**KEY WORDS:** THAI SOY SAUCE / VOLATILE FLAVOR COMPOUNDS / GAS CHROMATOGRAPHY-MASS SPECTROMETRY