

Formation by Halophilic Yeast of the Aroma Component, HEMF [2 (or 5)-ethyl-5  
(or 2)-methyl-4-hydroxy-3 (2H)-furanone] Specific to Miso

Etsuko SUGAWARA\* , Yonekichi SAKURAI\*\*

\*Faculty of Education, Iwate University

\*\*Faculty of Agriculture, Iwate University

Summary

4-Hydroxy-2 (or 5)-ethyl-5 (or 2)-methyl-3 (2H)-furanone (HEMF) which was first identified by the author as an aroma component of red salty rice miso (fermented soybean paste), has a strong, sweet cake-like aroma with a threshold value of less than 0.04ppb. It is a unique compound and is abundant in red salty rice miso and shoyu (soysauce). The authors have also found that HEMF was the most effective component in enhancing the aroma of red salty rice miso. On the other hand, HEMF is a strong antioxidant and exerted an anti-carcinogenic effect on benzo[a]pyrene-induced mouse forestomach neoplasia. HEMF was also found effective in preventing radiation hazard and has an important physiological function as well as being an aroma component.

The formation of HEMF by yeast was examined in an attempt to investigate its mechanism and involved factors. HEMF formation was promoted by yeast cultivation in a heat-sterilized medium which included glucose, ribose, and a nitrogenous compound such as an extract of shoyu koji, poly-peptone, casamino acid, or an amino acid (glutamic acid, threonine, serine, or alanine). It is suggested that HEMF was formed during the cultivation of yeast by using a precursor of HEMF which may have been produced by the amino-carbonyl reaction of pentose with amino acids during heating.

Halophilic yeast *Z.rouxii*, grown in a heat sterilized medium containing glucose, ribose and glycine with some nutritious inorganic salts bringing to amino-carbonyl compounds, forms appreciable amount of aroma compound HEMF in the medium. Yeast *S.cerevisiae* and halophilic yeast *C.versatilis*, grown in the same medium respectively, form smaller amount of aroma compound HEMF in the medium than *Z.rouxii* forms. The NaCl concentration in a medium had no effect on the amount of HEMF formed by *Z.rouxii*, but had effect on the rate of HEMF formation. These results were indicated probably that HEMF was formed from amino-carbonyl reaction product, and acetaldehyde or similar reactive substance to acetaldehyde formed by yeast.