Effect of *Lonicera japonica* Thunb. extracts additions on the keeping quality of Chinese-style sausage and Frankfurter

Guo-Chang Yu and Yun-Chu Wu*

Department of Animal Science and Biotechnology, Tunghai University, No 181, Section 3, Taichung-Kan Road, Taiwan 407-04 R. O. C.

*Corresponding author. (E-mail: ycwu@thu.edu.tw)

***Abstract*—**The purpose of this study was to investigate the effect of *Lonicera japonica* Thunb. extracts addition on the keeping quality of Chinese-style sausage and frankfurter. The Chinese-style sausage and frankfurter with *L. japonica* extracts (0%, 1%, 2% and 3%) addition. The results showed that Chinese-style sausages with *L. japonica* extracts addition had higher pH value, lower TBA value, lower number of total plate count and Coliform in the fourth week to eighth week and lactic acid bacteria in the second week to eighth week. No significant different on sensory evaluation of Chinese-style sausage among different concentrations of *L. japonica* extracts addition were found. In frankfurters, the addition of *L. japonica* extracts had lower TBA value and number of total plate count. No effect evaluation of frankfurters with *L. japonica* extracts addition in color, odor, hardness, juiciness and overall acceptability were found.

***Index Terms*:** *Lonicera japonica* Thunb., Meat product, Shelf life

I. INTRODUCTION

Lipid oxidation and microbial spoilage is great concern to the meat industry, because it leads to the development of undesirable rancid and potentially toxic substance. Thus synthetic compound are commonly used as food preservatives; however, the use of such synthetic substances had restricted such as some limitation because of their potential health risk. The plant of *Lonicera japonica* Thunb. (Caprifoliaceae), is a species of honeysuckle native to eastern Asia, including Japan, Korea, northern and eastern China, and Taiwan. *L. japonica* is traditionally used as a medicinal plant (Peng, Mei, Jiang Zhou and Sun, 2000). Pharmacological studies and clinical practice have demonstrated that *L. japonica* possesses many biological functions, including heapatoprotective, cytoprotective, antimicrobial, antioxidative, antiviral, and anti-inflammatory (Chang *et al*., 1995). This study was design to investigate the effect of *Lonicera japonica* Thunb. extracts addition on the keeping quality of Chinese–style sausage and frankfurter.

II. MATERIALS AND METHODS

Chinese-style sausage and frankfurter were manufactured with raw meat (80%), back fat (20%), and

Lonicera japonica Thunb. extracts (0%, 1%, 2% and 3%). Sausage samples stored at 4℃ were taken for keeping quality test every two weeks till eight weeks of storage. Color of Chinese-style sausage and frankfurter was measured with a CIE colorimeter to determine lightness (L*), redness (a*) and yellowness (b*). Furthermore, proximate analysis was determined according to A.O.A.C. (1995). pH value and 2-Thiobarbituric acid value (TBA value) of Chinese-style sausage and frankfurter was determined according to Ockerman (1985).Total plate count, lactic acid bacteria and Coliform was determined according to FDA (1998). Sensory evaluation was carried out by a trained panel on Chinese-style sausage and frankfurter. The data were analyzed using the completely randomized design, and the analysis of variance was performed to determine the significance for *L. japonica* extracts concentration and storage effect.

III. RESULTS AND DISCUSSION

The results showed that the Chinese-style sausage with *L. japonica* extracts had lower TBA value ($p < 0.05$) (Fig. 1), number of Coliform ($p < 0.05$) (Fig. 2), lactic acid bacteria ($p < 0.05$) (Fig. 3.) and total plate count ($p < 0.05$) (Fig. 4). No effect on sensory evaluation of Chinese-style sausage among difference concentrations of *L. japonica* extracts addition were found. In frankfurters, the addition of *L. japonica* extracts has lower TBA value ($p < 0.05$) (Fig. 5) and number of total plate count ($p < 0.05$) (Fig 6). No significant different on frankfurters among different concentrations of *L. japonica* extracts addition on color, odor, hardness, juiciness and overall acceptability were found.

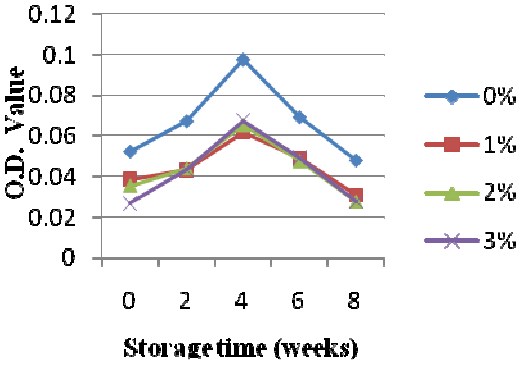

Fig.1. Effects of *L. japonica* extracts addition on TBA value of Chinese-style sausages during storage.

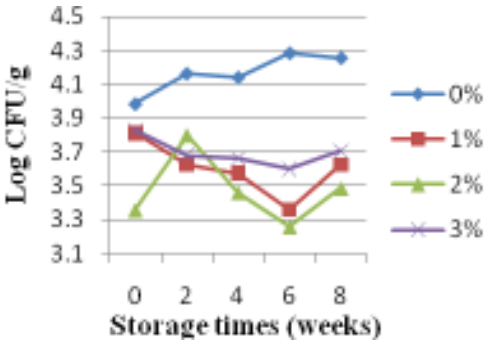

Fig.2. Effects of *L. japonica* extracts addition on Coliform of Chinese-style sausages during storage.

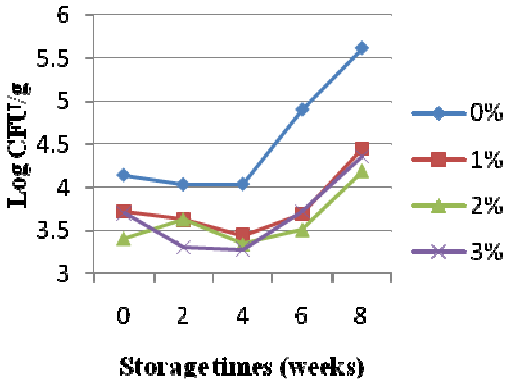

Fig.3. Effects of *L. japonica* extracts addition on Lactic acid bacteria of Chinese-style sausages during storage.

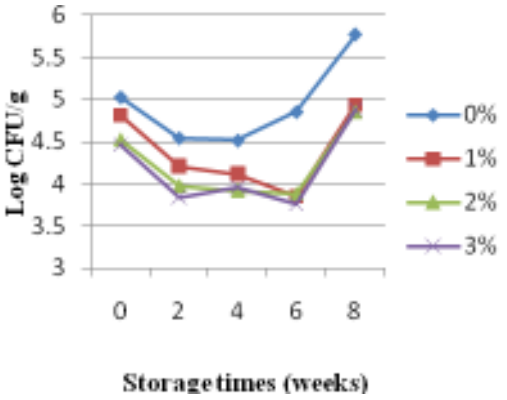

Fig.4. Effects of *L. japonica* extracts addition on total plate counts of Chinese-style sausages during storage.

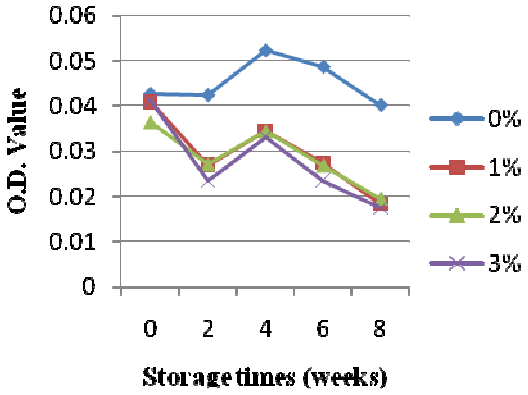

Fig.6. Effects of *L. japonica* extracts addition on TBA-value of frankfurter during storage.

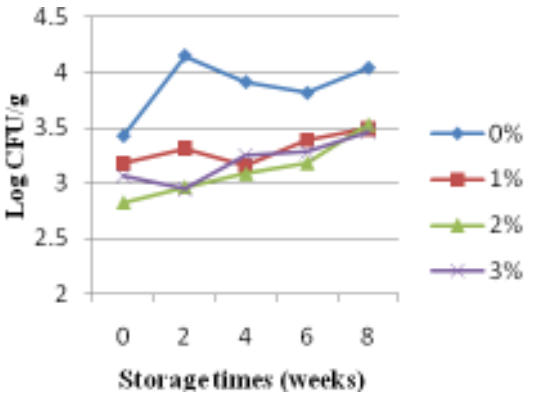

Fig.7. Effects of *L. japonica* extracts addition on total plate counts of frankfurter during storage s.

IV. CONCLUSION

The results of this study suggested that the possibility of using the extracts of *L. japonica* as a natural preservative in processed meat products of the antibacterial and antioxidative activities. The optimum level (1%) of *L. japonica* extracts in meat products could improve shelf-life and retain original flavors of processed meat product.

REFERENCES

Cai, Y. Z., Luo, Q., Sun, M., and Corke, H. (2004). Antioxidant activity and phenolic compounds of 112 traditional Chinese medicinal plants associated with anticancer. *Life Science*, 74, 2157-2184.

Chang, C. W., Lin, M. T., Lee, S. S., Karin, C. S., Liu, C., Hsu, F. L. (1995). Differential inhibition of reverse transcriptase and cellular DNA polymerase-ce activities by lignans isolated from Chinese herbs, Phyllanthus myrtifolius Moon, and tannins from Lonicera japonica Thunb and Castanopsis hystrix. *Antiviral Research*, 27, 367-374.

Peng, L. Y., Mei, S. X., Jiang, B., Zhou, H., & Sun, H. D. (2000). Constituents from Lonicera japonica. *Fitoterapia*, 71, 713-715.

Zhang, B., Yang, R., and Liu, C. Z. (2008). Microwave-assisted extraction of chlorogenic acid from flower buds of Lonicera japonica Thunb. *Separation and Purification Technology*, 62, 480-483.