ISOLATION AND IDENTIFICATION OF LACTIC ACID BACTERIA IN SOUR MEAT PRODUCED IN TAIWAN

C. S.Chou and M. T. Chen*

Department of Bioindustry Technology, Dayeh University, Dacun, Changhua, 51591 Taiwan
*Corresponding author (phone: +886-4-8511888-1760; fax: +886-4-8528466; e-mail: michen@ mial.dyu.edu.tw)

Abstract—The aim of this paper is to compare the lactic acid bacteria isolated from the sour meat in Taiwan. Results of identification of LAB is shown in Table 2.The species of LAB in the samples obtained from different areas are not all same. *Lactococcus lactis spp.lactis, Lactobacillus paracasei spp. paracasei* and *L. plantarum* are the predominants found in the sour meat in Taiwan. It is also found the common starter cultures for fermentation of sausage including *L. plantarum, Pediococcus acidilactici* and *Leuconostoc mesenteroides* presented in the sour meat. We also noted some lactic acid bacteria of the samples are the same as those of the sour meat obtained from France. However, we isolated an organism which has not been found in the fermented foods including yoghurt, cheese, sausage and pickled vegetables. It is identified as *L. buchneri* on which we are still working.

Key words: Sour meat, lactic acid bacteria, isolation and idenfication

I. INTRODUCTION

The fermented meat products are not popular in Asian countries except south Asian countries such as Thailand, Vietnam and Lao. In Taiwan, the aboriginal tribes they prepare the sour meat by a traditional method. Several years ago, we have done some research work on improvement of the processing and safety(Chou and Chen, 2007; Chen et al., 1992).

We have reported "Microbiological characteristics of sour meat." since 2007(53rd ICoMST). In order to establish the basic information of lactic acid bacteria distribution in sour meat, we keep on working. We already collected all the samples around the island and did isolation and identification work. The aim of this paper is to compare the findings with last experiment.

II. MATERIALS AND METHODS

Samples:12 samples were collected from different regions, 3 of them were from Hualien, 3 from Nantou, 2 from Miaoli, 1 from Keelung, 1 from Yilan and 1 from Kaohsiung, and got one from France(Nahnam, Vietnam).

Analysis: pH vale and titratable acidity were determined using the methods of AOAC(1990).

Bacterial counts:Total bacterial counts(TBC) and lactic acid bacterial counts(LABC) were determined by the methods of CNS 10890-N6186 and CNS 14760-N6317, respectively.

Isolation and identification of lactic acid bacteria:We screened the cultured bacterial colonies with Gram's stain and catalse test before identification. The organisms with G(+) and catalase(-) were recognized as lactic acid bacteria(LAB).

LAB colonies were identified with API 50CH/50CHL(BIOMERIEUX^{R}, France). After reacted with the API50CH strips of biochemical reagents for 48hr, the medium showed the color development. Identification of the LAB colonies was determined by the API software.

III. RESULTS AND DISCUSSION

pH value and titratable acidity, TBC and LABC are shown in Table 1. pH values are correlated with titratable acidities of the samples. The pH values of two samples are higher than 5.30 which can not inhibit undesirable organisms. It may be due to too short fermenting time or less steamed rice added.

Result of identification of LAB is shown in Table 2. The LAB species in the samples obtained from different areas are not all the same. *Lactococcus lactics spp. lactis*, *Lactobacillus paracasei spp. paracasei* and L.

plantarum are the predominants found in the sour meat. It is also found the common starter cultures for fermentation of sausage including *L. plantarum, Pediococcus acidilactici and Leuconostoc mesenteroide* presented in the sour meat. We also noted some lactic acid bacteria of the samples are the same as those of the sour meat(Nahnam) obtained from France.
However, we isolated an organism which has not been found in the fermented foods inclding yoghurt, cheese, sausage and pickled vegetables. It is identified as *Lactobacillus buchneri* on which we are still working.

IV. CONCLUSION

We almost collected the samples of the sour meat produced in Taiwan for isolation and identification of lactic acid bacteria. We obtain some of the organisms are useful and helpful for improving the sour meat or fermented sausage manufacturing. A new species-*L. buchneri* is isolated from one of samples, which is needed to work more in the future.

REFERENCES

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Table 1 pH value, titratable acidity, TPC and LAB counts of the sour meat in Taiwan

Sample no.	Sources	pH value	Titratable acidity%	TPC	LABC
1.	Hualien	4.38	0.36	$1.5x10^3$	$7.9x10^4$
2.	Hualien	4.58	0.85	$2.1x10^8$	$7.7x10^3$
3.	Hualien	5.30	0.09	$2.1x10^8$	$2.4x10^8$
4.	Nantou	4.80	0.14	$8.0x10^9$	$9.9x10^9$
5.	Nantou	3.84	2.34	-	$2.97x10^8$
6.	Nantou	3.63	1.08	-	$2.78x10^6$
7.	Miaoli	4.31	0.45	$1.5x10^8$	$2.2x10^5$
8.	Miaoli	5.27	0.72	$2.1x10^7$	$1.51x10^7$
9.	Yilan	5.65	0.09	$9.4x10^8$	$1.4x10^7$
10.	Keelung	4.81	0.31	$3.9x10^8$	$2.6x10^7$
11.	Kaohsiung	5.96	0.09	$3.9x10^5$	$6.0x10^2$
12.	France	4.81	0.31	$8.6x10^7$	$7.8x10^7$

Table 2 The lactic acid bacteria species isolated and identified from sour meat produced in Taiwan

Sample no.	sources	Species names
1.	Hualien	*Lactococcus lactis spp. lactis*
2.	Hualien	*Lactococcus lactis spp.lactis*
3.	Hualien	*Lactococcus lactis spp. lactis*
		Lactobacillus pentosus
		L. paracasei spp. paracasei
		L. brevis
4.	Nantou	*L. plantarum*
5.	**Nantou**	*L. plantarum*
6.	**Nantou**	*L. Buchneri*
7.	Miaoli	*Lactococcus lactis spp. lactis*
		L. plantarum
		L.paracasei spp. paracasei
8.	Miaoli	*Leuconostoc mesenteroides*
		L. paracasei spp. paracasei
9.	Yilan	*Pediococcus acidilactici*
10.	Keelung	*L.plantarum*
		Pedio. Acidilactici
11.	Kaohsiung	*Lactococcus lactis spp. lactis*
12.	France	*L. curvatus*
		Leuco. Mesenteroides
		L. brevis