

INDUSTRIAL PRODUCTION OF STARTERS FOR TRADITIONAL FERMENTED MILK PRODUCTS

Sh. Akhmetsadykova^{1,2}, A. Baubekova², G. Konuspayeva³, N. Akhmetsadykov², B. Faye^{3,4}, G. Loiseau⁵

¹ Kazakh National Agrarian University, 8 av. Abai 050013 Almaty, Kazakhstan

² Scientific and Production Enterprise Antigen, 4 Azerbayev street, 040509, Almaty region, Kazakhstan

³ Camel Range and Research Center, P.O. Box 322, Sakaka, Kingdom of Saudi Arabia

⁴ CIRAD - Département Environnements et Sociétés, Campus International de Baillarguet, TA C- or DIR / B 34398 Montpellier, Cedex 5, France

⁵ UMR Qualisud, CIRAD, TA B-95/16, 73, rue J.-F. Breton, 34398 Montpellier Cedex 5, France



INTRODUCTION

Kazakh people bred horses and camels, and consumed their milk under fermented products for the centuries. Up to now fermented camel milk called *shubat* and fermented mare's milk called *koumiss* are the important parts of local people diet. They are mainly made by traditional way, using spontaneous starters. Nowadays, producers are trying to modernize manufacture of these traditional fermented products, because consumption is increasing every year. The main requirement for establishing modern industrial production is to control fermentation process, which is not possible without using starters.

Therefore, the present study was carried out to study microflora diversity of dairy samples and create starters with local strains.

MATERIALS AND METHODS

Dairy samples were collected from 4 regions of Kazakhstan with high camel population. LAB strains and yeast were identified by PCR-based methods with 16S rDNA sequence analysis and by PCR-DGGE technique, respectively.

MM - mare milk
K - Koumiss
CM - camel milk
S - Shubat

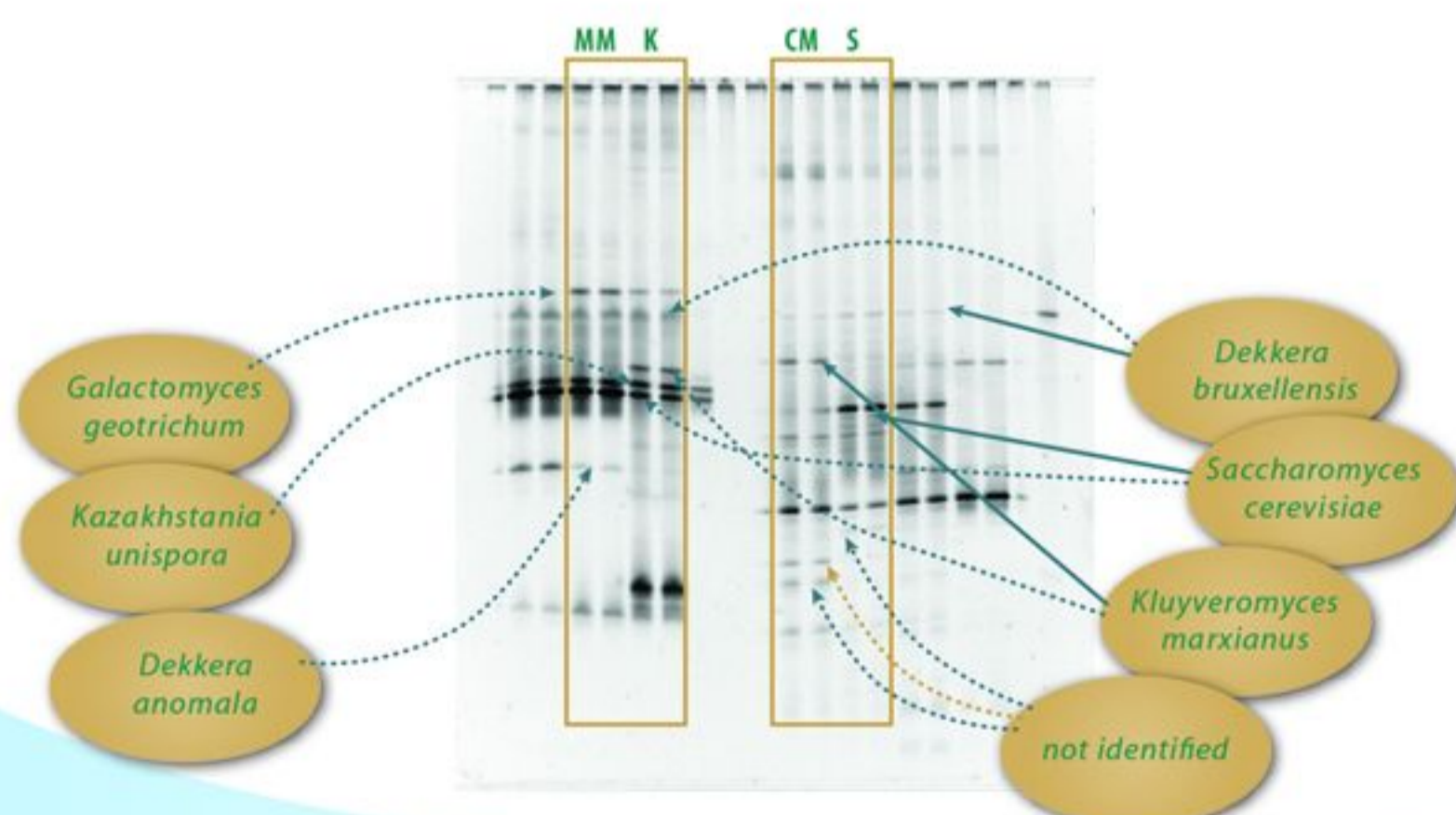


Fig. DGGE analysis of fresh and fermented mare's and camel milk

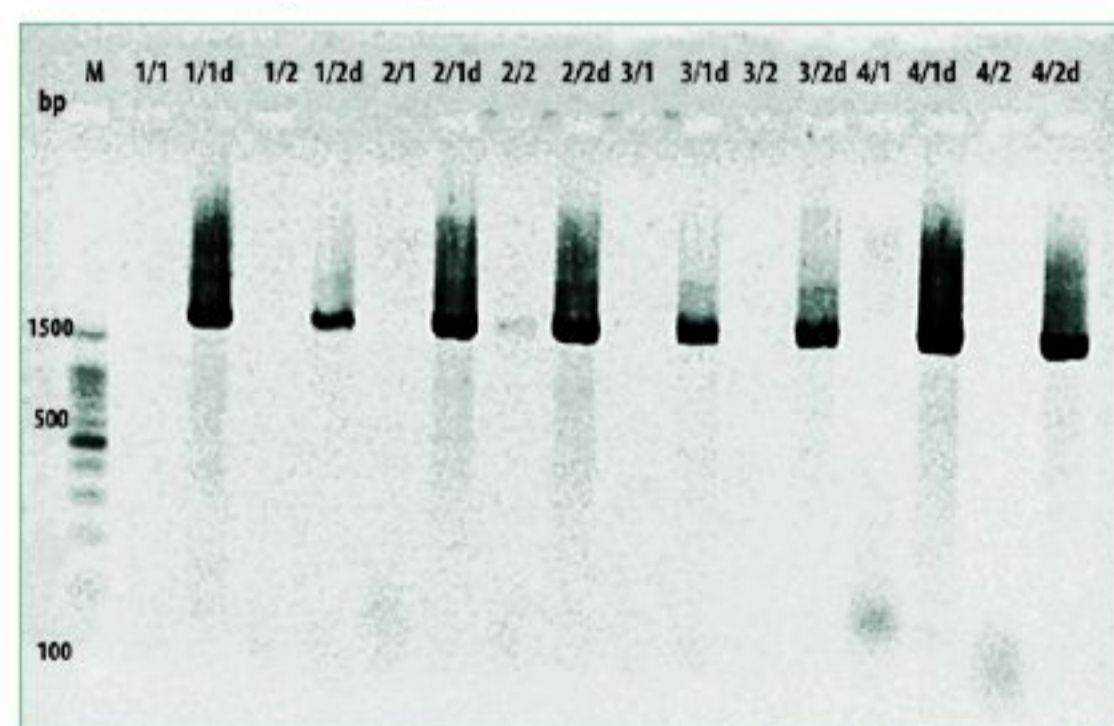
RESULTS

From shubat samples 46 LAB strains and 11 yeasts and 34 LAB strains and 12 yeasts were isolated from koumiss, respectively. The most part of LAB isolates belonged to Enterococcus group in *shubat* and Lactobacillus group for *koumiss*, respectively. According with results the dominant yeast in koumiss were *Saccharomyces cerevisiae*, *Kazakhstania unispora*, *Galactomyces geotrichum*. In shubat the majority were *Kluyveromyces marxianus* group and *Saccharomyces cerevisiae* species.

In the next step, kinetics of growing, acidification ability, organoleptic properties and antagonistic activity of each selected 8 LAB strains and 6 yeasts were studied. Also, optimal industrial nutritive mediums, deep cultivation (10 L, 120 L) and lyophilization conditions were tested and selected. Maximal biomass concentration (1014) was obtained after deep cultivation method on bioreactor (Shanghai, China).

CONCLUSION

The study results give possibilities for producing starters with defined technological properties by using local strains. Thus, it will be an important step for camel milk processing in Kazakhstan. Created starters will be tested not only on camel and mare's milk, but also on cow milk. Realization to Central Asia countries is planning.



2% Agarose gel for verification PCR products of bacterian DNA with W001 and 2351 amorces producing 1500 amplicons

