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# Application of *Lactobacillus pentosus* LLA8 from pickled bamboo shoot in making of probiotic drink

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Photograph adapted from  
Agatha Putri Algustie, 2017



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# Outline

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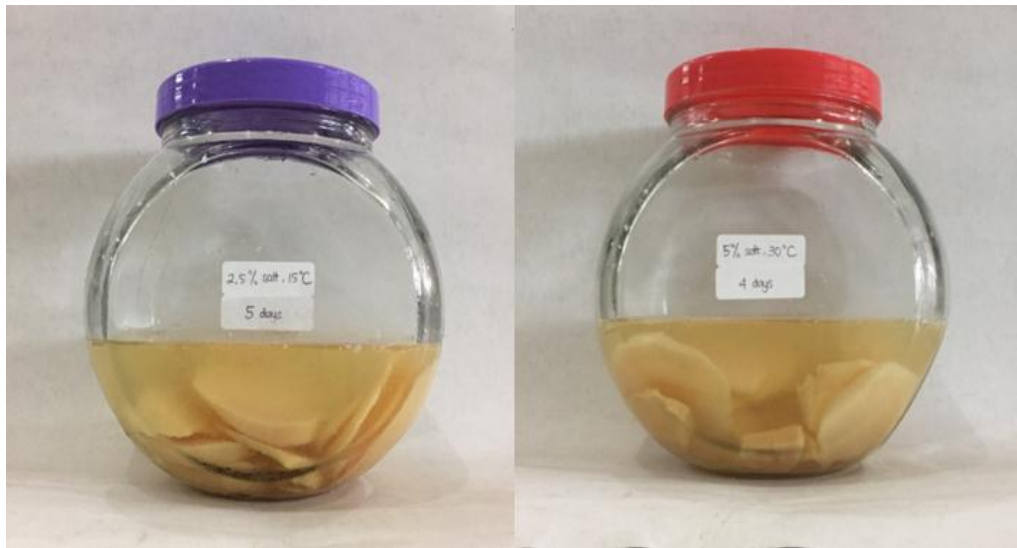
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# 01 Introduction



# Benefits of bamboo shoots

Aids in weight loss



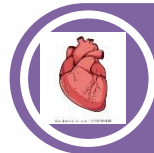
Effective against respiratory diseases

Reduces risk of cancer



Useful in curing snake and scorpion bites

Helps improve heart health



Strengthens immune system

Phytosterols

Phytonutrients

➔ **Dissolving harmful Low-density Lipoprotein (LDL) cholesterol in the body.** This eases cholesterol out of arteries for the smooth supply and movement of blood throughout the body.

➔ **Consumption of bamboo shoots is also helpful in decreasing LDL levels of cholesterol, with stable glucose levels.** This is due to the fact that bamboo shoots contain negligible amounts of fat and very low calories.

➔ **The vitamins and minerals in bamboo shoots are ideal for improving the body's immune system. The vitamins, minerals, and antioxidants present in bamboo shoots are essential for strengthening the body from inside-out.**

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02

# Aim of research



The aim of research is to determine physicochemical and microbiology characteristics of probiotic drink and to measure its effectiveness in decreasing blood glucose and total cholesterol levels using Sprague dawley rats.

# 03 Method





Yellow Bamboo shoot pickle  
Based on morphology and physiology analysis, isolates have genus characteristics such as *Lactobacillus*

Bacteriocin producing LAB from bamboo shoot pickle which fermented in: 2.5% of salt concentration at 15°C (A) and 5.0% of salt concentration at 30°C (B).

Fermented milk using lactic acid bacteria isolates from bamboo shoot pickles has been promising as probiotics drink.

Sprague dawley



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**PROBIOTIC  
DRINK**

***Lactobacillus pentosus* → isolates for probiotic drink (fermented milk)**



sterilizing and

and Return

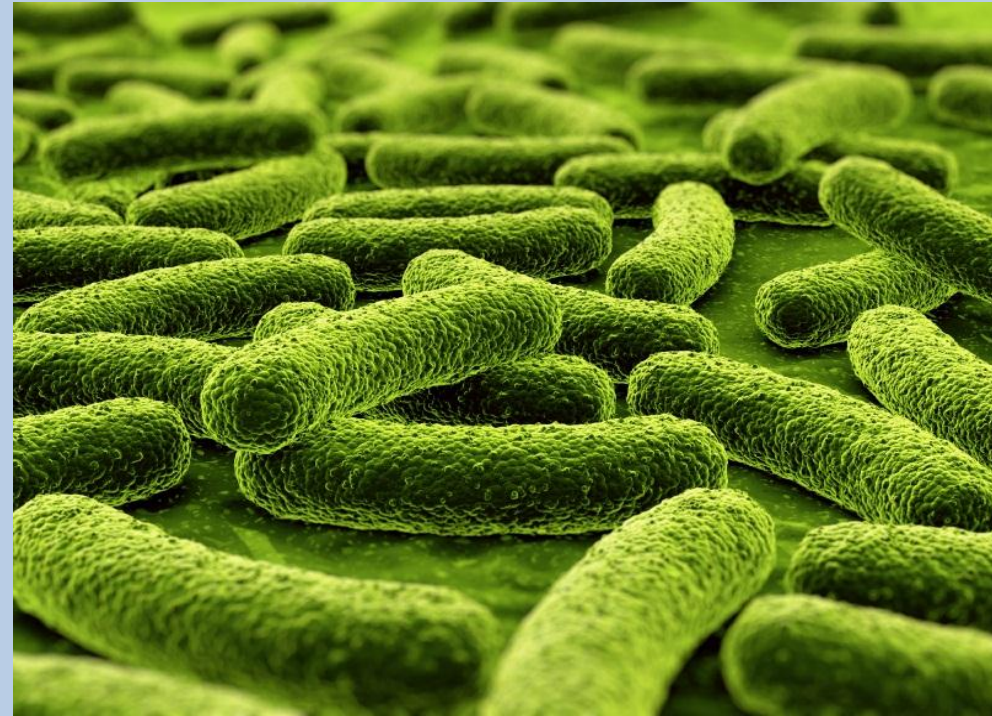
04

# Result and discussion





Photograph adapted from  
Agatha Putri Algustie, 2017



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Result of API Software Identification (24 hours  
Incubation): *Lactobacillus pentosus* (97.3%)

Table 1. The result of fat, protein, ash and lactic acid fermented milk of *Lactobacillus pentosus* LLA8

Parameter (%)	Dossage 1	Dossage 2	Dossage 3
Fat	0.24	0.32	0.57
Protein	18.92	22.95	17.26
Ash	0.71	0.63	0.73
Lactic acid	0.95	0.72	0.65

Range of pH: 3.8–4.61

- Dossage 1 ( $9.2 \times 10^9$  CFU/ml)
- Dossage 2 ( $8.9 \times 10^8$  CFU/ml)
- Dossage 3 ( $2.3 \times 10^8$  CFU/ml)

# Table 2. Blood glucose of sprague dawley (mg/dL)

Treatment	Blood glucose (mg/dL)			
	Day-0	Day-3	Day-14	Day-29
Normal	71.99 ± 2.17	74.28 ± 2.57	74.64 ± 2.50	75.25 <sup>a</sup> ± 2.80
Control (Negative)	71.89 ± 3.06	259.29 ± 3.55	260.22 ± 3.76	261.21 <sup>b</sup> ± 3.68
Comercial	69.99 ± 1.73	258.49 ± 2.85	191.71 ± 1.60	186.70 <sup>c</sup> ± 2.07
Dossage 1	71.37 ± 2.42	260.29 ± 3.15	175.91 ± 2.72	147.78 <sup>d</sup> ± 2.31
Dossage 2	67.89 ± 1.66	255.13 ± 2.86	172.37 ± 2.40	132.70 <sup>e</sup> ± 3.31
Dossage 3	72.25 ± 2.93	260.82 ± 3.47	175.80 ± 1.88	122.91 <sup>e</sup> ± 2.13

- Numbers show the average ± standard deviation.
- A number followed by the different of superscript: there was a significant difference at 95% (p<0.05) confidence level. 52.88
- Day-0 (before induction); Day-3 (after induction); Day-14 and 29 (after treatment)
- Dossage 1 (9.2 x 10<sup>9</sup> CFU/ml)
- Dossage 2 (8.9 x 10<sup>8</sup> CFU/ml)
- Dossage 3 (2.3 x 10<sup>8</sup> CFU/ml)

# Table 3. Total cholesterol of sprague dawley (mg/dL)

Treatment	Total cholesterol (mg/dL)			
	Day-0	Day-3	Day-14	Day-29
Normal	78.60 ± 2.19	79.37 ± 2.54	79.74 ± 2.65	81.25 <sup>a</sup> ± 2.88
Control (Negative)	82.89 ± 4.32	155.64 ± 4.17	156.13 ± 3.78	158.02 <sup>b</sup> ± 2.93
Comercial	80.27 ± 3.56	153.64 ± 4.75	145.09 ± 3.99	139.80 <sup>c</sup> ± 3.06
Dossage 1	81.42 ± 5.76	156.42 ± 6.29	121.78 ± 5.22	118.28 <sup>d</sup> ± 4.60
Dossage 2	82.99 ± 4.01	157.20 ± 4.07	122.19 ± 3.47	114.76 <sup>d</sup> ± 5.52
Dossage 3	85.82 ± 3.50	159.98 ± 3.67	125.13 ± 3.35	96.77 <sup>e</sup> ± 3.39 39.51

- Numbers show the average ± standard deviation.
- A number followed by the different of superscript: there was a significant difference at 95% (p<0.05) confidence level.
- Day-0 (before induction); Day-3 (after induction); Day-14 and 29 (after treatment)
- Dossage 1 (9.2 x 10<sup>9</sup> CFU/ml)
- Dossage 2 (8.9 x 10<sup>8</sup> CFU/ml)
- Dossage 3 (2.3 x 10<sup>8</sup> CFU/ml)



#60648792

***Lactobacillus pentosus* LLA8** was potential for probiotic drink and decreased blood glucose (52.88%) and total cholesterol (39.51%) at the dose by  $2.3 \times 10^8$  CFU/ml.

Consumption of probiotic fermented milk in Sprague Dawley rats (T2DM) decreased the blood glucose and total cholesterol.



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## Research Article



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(www.interscience.wiley.com) DOI 10.1002/jsfa.4034

# Isolation and characterization of lactic acid bacteria from *jiang-sun* (fermented bamboo shoots), a traditional fermented food in Taiwan

Yi-sheng Chen,<sup>a\*†</sup> Hui-chung Wu,<sup>a†</sup> Chia-hua Liu,<sup>a</sup> Hung-chieh Chen<sup>a</sup>  
and Fujitoshi Yanagida<sup>b</sup>

Hindawi Publishing Corporation  
International Scholarly Research Notices  
Volume 2014, Article ID 679073, 17 pages  
<http://dx.doi.org/10.1155/2014/679073>



*Review Article*

## **The Nutritional Facts of Bamboo Shoots and Their Usage as Important Traditional Foods of Northeast India**

**P. Nongdam and Leimapokpam Tikendra**

*Department of Biotechnology, Manipur University, Canchipur, Imphal, Manipur 795003, India*

Correspondence should be addressed to P. Nongdam; [purenba@rediffmail.com](mailto:purenba@rediffmail.com)

3rd ICSAF (9 Nov 2018)

*Review Article*

# **Fermented Fruits and Vegetables of Asia: A Potential Source of Probiotics**

**Manas Ranjan Swain,<sup>1</sup> Marimuthu Anandharaj,<sup>1</sup>  
Ramesh Chandra Ray,<sup>2</sup> and Rizwana Parveen Rani<sup>3</sup>**

<sup>1</sup> *Department of Biotechnology, Indian Institute of Technology Madras, Chennai, Tamil Nadu 600036, India*

<sup>2</sup> *Centre for Tuber Research Institute, Bhubaneswar, Orissa 751019, India*

<sup>3</sup> *Gandhigram Rural Institute-Deemed University, Gandhigram, Tamil Nadu 624302, India*

3rd ICSAF (9 Nov 2018)

Original Article



JYP

# Exploring Indigenous *Lactobacillus* Species from Diverse Niches for Riboflavin Production

Kiran Thakur and Sudhir Kumar Tomar

*Dairy Microbiology, Department, Nutrition National Collection of Dairy Cultures, Dairy Microbiology Division, National Dairy Research Institute, Karnal, Haryana, INDIA-132001.*

Journal of Young Pharmacists Vol 7 • Issue 2 • Apr-Jun 2015

3rd ICSAF (9 Nov 2018)

## **Bacteriocins: Promising Natural Antimicrobials**

**Medine Güllüce<sup>1</sup>, Mehmet Karadayı<sup>1</sup> and Özlem Barış<sup>1</sup>**

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Bacteriocins are described as ribosomally synthesized small poly peptides that exert antimicrobial effects against closely or non-closely related bacteria. The major producer group for bacteriocins is lactic acid bacteria (LAB) that contain a great variety of microorganisms described as “generally recognized as safe (GRAS)” by the US Food and Drug Administration. Due to this accredited safety potency of their origin and the wide-range effectiveness on pathogenic or spoilage bacteria, bacteriocins have attracted great research interest as natural antimicrobial agents, thereby allowing the design of new technologies for combating microbial pathogens in many industrial applications. For example, bacteriocins play a crucial role in maintaining the food safety and several bacteriocin preparations are commercially available for wide-range applications in the industry.

On the other hand, although many research efforts have been successfully done up to date, it is remarkable that there are still several gaps in this subject. Filling these gaps fundamentally requires a clear understanding on the nature of bacteriocins and carefully considered research strategies. Thus, the present study will include general information about bacteriocins such as definition, origin, nature and more complicated issues including effect mechanisms, application and development strategies.

**Keywords** bacteriocins; natural antimicrobials; effect mechanism; biopreservative agents



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journal homepage: [www.elsevier.com/locate/foodcont](http://www.elsevier.com/locate/foodcont)



### Review

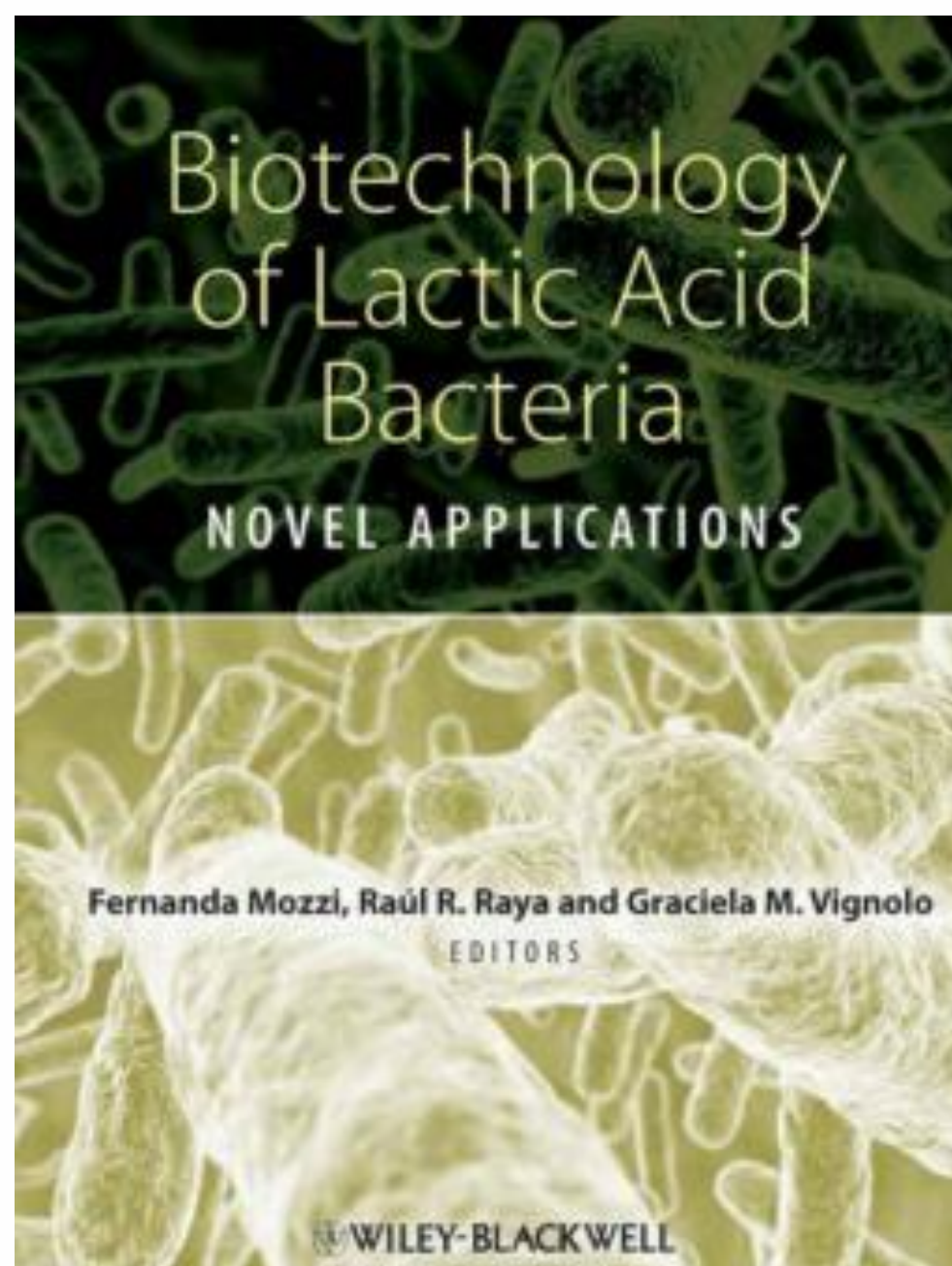
## Novel biotechnological applications of bacteriocins: A review

Eduardo Marcos Balciunas<sup>a</sup>, Fabio Andres Castillo Martinez<sup>a</sup>, Svetoslav Dimitrov Todorov<sup>b</sup>,  
Bernadette Dora Gombossy de Melo Franco<sup>b</sup>, Attilio Converti<sup>c</sup>, Ricardo Pinheiro de Souza Oliveira<sup>a,\*</sup>

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<sup>c</sup> *Department of Chemical and Process Engineering, Genoa University, Genoa I-16145, Italy*





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