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## PROPERTIES OF *KLUYVEROMYCES MARXIANUS* STRAINS ISOLATED FROM NATURAL BIOTOPES

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### Introduction

*Kluyveromyces marxianus* yeast is often isolated from dairy products and used as probiotic agents in food. As a producer-yeast, they must be genetically stable, have simple nutrient requirements, be effective in hostile conditions, grow on inexpensive nutrient media and be easy to store and distribute.

**This work aimed** at characterizing the physiology of the yeast *K. marxianus* under different cultivation conditions.

### Material and methods

Nineteen strains of *K. marxianus* isolated from natural biotopes were tested for their ability to grow on various carbon sources. For this, the YPD medium (1% yeast extract, 2% peptone, 2% dextrose, pH 5.5) was used with the addition of 20 g/L of one of the following carbon sources: glucose, sucrose, lactose, maltose, mannitol, arabinose, xylose, and galactose. The cultivation was carried out for 1-3 days. All isolates were also tested for their ability to grow in YPD broth at different temperatures (4, 27, 37, 40, 42, 46 and 48 °C) and pH (5; 3 and 2).

### Results

*K. marxianus* strains showed widespread use of the substrate and high resistance to elevated incubation temperatures. All tested strains grew at 27 and 37 °C and one strain grew at 46 °C. None of the strains showed active growth at pH 2 and all cultures grew actively at pH 3. At the same time five strains showed growth at pH 5.0. All strains fermented galactose, 16 - xylose, 9 - glucose, 7 - lactose, 12 - maltose, 11 - arabinose, 5 - sucrose, 13 - mannitol. It should be noted that all strains in this study have showed fully restored growth after 2 hours' incubation at pH 2. It indicates that they could survive when passing through the gastric passage into the intestine. These properties make the use of *K. marxianus* and its metabolites indispensable in agriculture as a feed additive.

**Conclusion:** diversity of *K. marxianus* species at the genetic, metabolic, and physiological levels is relatively little explored, a wide range of applications of *K. marxianus* is exists but a greater depth of knowledge in the genetic diversity or population genetics is still required.

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Table. 1.. Growth of *K. marxianus* yeast isolates after 3 days of incubation on YPD medium (n = 19).

No. of strain	Glucose	Lactose	Galactose	Maltose	Arabinose	Sucrose	Mannitol	Xylose	27 °C	37 °C	40 °C	42 °C	46 °C	pH 2	pH 3	pH 5
KM 125	+	+	+	-	+	-	+	+	+	+	+	+	+	-	+	+
KM 15	-	-	+	+	+	-	+	+	+	+	+	-	-	-	+	-
KM 154	+	+	+	+	+	+	-	+	+	+	+	-	-	-	+	-
KM 2	-	-	+	-	+	-	+	-	+	+	-	-	-	-	+	-
KM 201	+	+	+	+	+	-	+	+	+	+	-	-	-	-	+	-
KM 21	-	+	+	-	-	-	+	+	+	+	+	-	-	-	+	+
KM 217	-	+	+	+	+	+	-	-	+	+	+	+	-	-	+	-
KM 218	+	-	+	+	-	-	+	+	+	+	+	+	-	-	+	-
KM 303	-	-	+	-	+	+	+	+	+	+	-	-	-	-	+	-
KM 32	+	+	+	+	-	-	+	+	+	+	+	-	-	-	+	+
KM 328	+	-	+	+	+	-	+	+	+	+	-	-	-	-	+	-
KM 40	-	-	+	+	-	-	+	-	+	+	-	-	-	-	+	-
KM 409	-	+	+	-	+	+	-	+	+	+	+	-	-	-	+	+
KM 412	-	-	+	-	+	+	+	+	+	+	-	-	-	-	+	-
KM 417	+	-	+	+	-	-	+	+	+	+	+	+	-	-	+	-
KM 554	-	-	+	-	+	-	-	+	+	+	+	-	-	-	+	+
KM 733	+	-	+	+	-	-	+	+	+	+	-	-	-	-	+	-
KM 845	+	-	+	+	-	-	-	+	+	+	+	+	-	-	+	-
KM 9	-	-	+	+	-	-	-	+	+	+	+	+	-	-	+	-

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