

# **Isolation of lactic acid bacteria and yeasts from fermented corn gruels with angiotensin converting enzyme (ACE) and hydroxymethylglutaryl-coenzyme A (HMG-CoA) reductase inhibitory activities**

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## **Abstract**

**Background:** This study was designed to investigate the HMG-CoA reductase and ACE-inhibitory activities of lactic acid bacteria (LAB) and yeasts isolated from fermented corn gruels for the production of functional foods/nutraceuticals. The use of “statins” and “prils” as inhibitors of HMG-CoA reductase and ACE for the treatments of hyperlipidemia and hypertension are usually accompanied by adverse side effects. Hence, the need for alternative sources of HMG-CoA reductase and ACE inhibitors from food-grade micro-organisms arises.

**Methods:** LAB and yeasts were isolated and characterized from fermented maize gruels using standard methods. The HMG-CoA reductase and ACE inhibitory activities of the LAB and yeast cultures were also carried out using established protocols.

**Results:** The screening of LAB with HMG-CoA reductase and ACE-inhibitory activities revealed that at concentrations (mg/mL) of 3,6, 12 and 24, *Lactobacillus helveticus* MZL12 showed the highest HMG-CoA reductase-inhibitory activities of 5.96, 9.63, 12.84 and 15.14, with corresponding ACE-inhibitory activities of 8.41, 16.60, 19.47 and 25.00, respectively, when compared with other isolates. In addition, at concentrations (mg/mL) of 6, 12, 24 and 48, the yeast isolate *Cryptococcus* sp. MZY13 showed the highest HMG-CoA reductase-inhibitory activities of 8.72, 11.92, 19.72 and 22.48, with corresponding ACE-inhibitory activities of 13.93, 35.11, 41.41 and 57.63, respectively. *L. helveticus* MZL12 also showed the lowest HMG-CoA reductase half maximal concentration inhibitory (IC<sub>50</sub>) value of 84.84 µg/mL, with an ACE IC<sub>50</sub> value of 46.09 µg/mL, while *Cryptococcus* sp. MZY13 had the lowest IC<sub>50</sub> values of 108.38 µg/mL and 49.93 µg/mL for HMG-CoA reductase and ACE inhibition, respectively.

**Conclusions:** Used together, *L. helveticus* MZL12 and *Cryptococcus* sp. MZY13 can be employed as potential starter cultures with HMG-CoA reductase and ACE-inhibitory activities that can be used for the fermentation of functional foods targeted against hyperlipidemia and hypertension.

**Keywords**

Cereal fermentation, *Lactobacillus helveticus*, starter cultures, *Cryptococcus* sp., half-maximal inhibitory concentration (IC<sub>50</sub>).