



Alleviating effect of a probiotic mixture or gum Arabic in a Non-Alcoholic steatohepatitis rat model and modulation of gut microbiota

Sahar Y. Al-Okbi¹, Magdy A. Amin², Yasser M. Ragab², Amal E. A. Mohamed³, Amr E. Edris⁴, Osama M. Sharaf⁵, Hoda B Mabrok¹, Asmaa A. Ramadan¹

¹Nutrition and Food Science Department, National Research Centre, Cairo, Egypt.

²Microbiology and Immunology department, Faculty of Pharmacy, Cairo University, Cairo, Egypt.

³Faculty of Pharmaceutical Sciences and Pharmaceutical Industries, Future University.

⁴Aroma and Flavor Chemistry, National Research Centre, Dokki, Cairo, Egypt.

⁵Dairy Sciences Department, National Research Centre, Cairo, Egypt.

ABSTRACT (up to 300 words)

Background: Combating steatohepatitis is crucial since it may induce liver failure and cardiovascular diseases and may lead to liver carcinoma. **Objective:** The present study evaluated the protective effect of probiotics and prebiotic (gum Arabic) towards steatohepatitis. **Methods:** Thirty Sprague Dawley rats were divided into five groups, the first served as normal control (NC). Steatohepatitis was induced in four groups using a high fructose-saturated fat diet (HFFD), one group served as fatty liver control (FC). The other test groups received daily oral doses of either probiotic mixture (*Lactobacillus plantarum* and *Bifidobacterium breve*), gum Arabic, or ursodeoxycholic acid (as a reference drug). Firmicutes (F) and Bacteroidetes (B) phyla were quantified in colon content using qPCR and the ratio (F/B) was calculated. Counts of *Lactobacillus plantarum* and *Bifidobacterium breve* were also estimated.

Liver total fat, plasma lipopolysaccharides (LPS), plasma interleukin-6 (IL-6), plasma lipocalin 2 (LCN2), LCN2 in colon content, and plasma lipid profile were assessed along with histopathological examination of liver and colon. Nutritional parameters were also calculated. **Results:** Significant increase in plasma IL-6, LCN2 of plasma and colon content, and F/B ratio was seen in FC compared to the NC. Fatty liver control exhibited a significant increase in liver fat and dyslipidemia with histopathological alterations. Probiotics mixture showed reduction in liver total fat, plasma LCN2, IL-6, LCN2 of colon content, and F/B ratio with improvements in the histopathology of liver and colon. Gum Arabic significantly reduced liver fat, LCN2 in plasma and colon content, triglycerides, and improved the histopathological picture. **Conclusion:** Probiotics and Gum Arabic might be promising treatments for non-alcoholic steatohepatitis.



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BIOGRAPHY (up to 200 words)

Asmaa Ramadan Taha has completed her PhD from the school of pharmacy, Cairo University, Egypt. She is a researcher in the department of Nutrition and food science at the National Research Center in Egypt. Her main field of expertise is nutritional microbiology and immunology with a special interest in the effects of gut microbiota on human health and the link to chronic disease. She has more than 10 years of experience working with leading figures in the field at different labs including the microbiology labs at the school of pharmacy in Cairo University, National Research Center, and the Beltsville Human Nutrition research Center at USDA in Beltsville, Maryland, USA. She uses techniques of multi-OMICs and NGS to tackle important questions about the cross talk between the gut microbiome and chronic diseases. She has several publications in highly cited journals. She received several awards in recognition of her work.

Presenter Name: Asmaa Ramadan Taha

Mode of Presentation: Oral

Contact number: +201001216688

Email ID: asmaamr2@gmail.com

ae.ramadan@nrc.sci.eg

