

## 9<sup>th</sup> International Webinar on BIOTECHNOLOGY RESEARCH

February 25, 2022 | Webinar

### **Sudanese gums as prebiotic supplementation: What does it mean from a biotechnological and immune boosting perspective?**

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The European Union, the Codex Alimentarius, and the Food and Drug Administration have finally agreed that Sudanese gums (SGs) are dietary fiber. This pioneering study aimed to screen the potential prebiotic activity of an optimum blended formula of SGs (composed of *acacia seyal* gum and *acacia senegal* gum), commercially known as prebio-m and prebio-t, respectively, to evaluate their biomarker status using short-term batch in-vivo experiments to support the innate immune system. Artificial stomach (SHIME system) and quantitative polymerase chain reaction (qPCR) analysis are used for evaluating the potential prebiotic properties of Prebio-M and Prebio-T. The biomarker substances, including short-chain fatty acids, ammonium, pH and prebiotic bacteria, were investigated using an artificial stomach (pH2, pepsin); small intestine (porcine pancreatic enzymes and bile salts); and large intestine (representative bacterial inoculum). Samples were taken at the beginning, after 24h and 48h for DNA extraction. The short-chain fatty acids (SCFA) produced by prebio-m led to an increase of all three main SCFAs (proportionally more propionate). While prebio-t was mainly correlated to a butyrogenic effect. High lactic acid production was seen in prebio-t compared to Prebio-M. The ammonium concentration of Prebio-T was 34% lower, significantly ( $P \leq 0.05$ ) than production compared to Prebio-M. Intestinal incubation with Prebio-T revealed a higher concentration of pH decrease. Gas production, Prebio-M led to higher gas production as compared to Prebio-T. Moreover, both products increased the concentration of total bacteria and were correlated with a bifidogenic and lactobacillogenic effect. However, both products clearly indicated potential prebiotic activity, leading to different fermentation profiles. Thus, Prebio-M released higher SCFA production and bifidogenic/lactobacillogenic effects. Overall, Prebio-T is mostly butyrogenic, with less ammonium and gas production and an effect that is bifidogenic or lactobacillogenic. Finally, this data suggests that both products might have prebiotic ingredients for future biological applications.

#### **Biography**

Ahmed A M Elnour received his B.Sc. degree in biochemistry from the University of Kordofan-Sudan. He also holds a master's degree "excellent" in analytical chemistry from Khartoum University and a doctorate "Excellent/best thesis" in biotechnology engineering from the International Islamic University Malaysia. In 2020, he was appointed as a postdoctoral research fellowship sponsored by the Islamic Development IsDB merit scholarship program. His project is entitled "Cancer-on-a-chip base as a new paradigm potential application of gum arabic extraction toward development of breast cancer therapeutics". Elnour's main research interests are integrating biotechnology engineering and phytochemistry related to medicinal plants and chemical solvent system extracts of leading bioactive compounds (LBCPs) to apply to the human organs-on-a-chip model as a novel technique for personalized medicine and anti-inflammatory agents.

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