

## Chinese Alcoholic beverages and Probiotics such as *Akkermansia Muciniphila* as Protective Factors of Alcoholic Hepatic Disease

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The distribution of the consumption of alcoholic beverages is wide in various regions of the world, it represents the culture and economy of these, in turn it is one of the factors that contribute to the development of various conditions such as alcoholic liver disease, becoming a health problem public since there is a relevant percentage of associated morbidity and mortality [1]. Therefore, it is necessary to know the range of chemical components of different liquors according to their raw material, production processes and fermentation to evaluate their toxicity and the ability of some substances to provide protection to the intestinal barrier.

Different studies have found that mice fed CB containing an equivalent amount of EtOH exhibited significantly lower levels of liver injury and steatosis than mice fed EtOH alone. This is because baijiu liqueurs differ from western liqueurs by their volatile and non-volatile organic compounds that act as markers. For example, in aging processes esters are important compounds for the flavor in distilled spirits, in Chinese baijiu the most abundant is lactic acid ethyl ester, followed by pentanoic acid ethyl ester and decanoic acid ethyl ester, unlike liqueurs Western countries where the octanoic and decanoic ester predominate. Other volatile organic compounds are alcohols and benzene derivatives, where the main alcohol is 1-butanol, 3 methyl. In turn, organic acids such as octanoic acid and short chain fatty acid such as acetic acid, butanoic acid and hexanoic acid are predominant in the Chinese drink while in western liquors medium chain fatty acids predominate. Within the non-volatile organic compounds, lactic acid is significant [2]. The chemical differences of Chinese baijiu with Western liquors confirm how it prevents the destruction of the intestinal barrier and

protects against the decrease in the amount of *Akkermansia*, thus attenuating liver damage, for which they are bioactive components that mitigate intestinal dysbiosis and oxidative damage. caused by ethanol. In this way, the hyperpermeability of the intestinal barrier will not be severe and there will not be interruptions in cell junctions between the extracellular matrix of the gastric mucosa epithelium, becoming a protective factor against liver damage, since endotoxins such as lipopolysaccharides, peptidoglycans and Bacterial products of the families such as Prevotellaceae, Enterobacteriaceae, Veillonellaceae and Streptococcaceae that were present in alcoholic liver disease will be absent since there is no displacement of these molecular patterns of pathogens through the hepatic portal system [3].

The gastrointestinal tract tube towards its lumen is lined by epithelial cells that make up the mucosa and some of them have the function of secreting mucus for the maintenance of the intestinal barrier, factors such as the intestinal microbiota influence also in its physiology, therefore, chemical agents such as ethanol promote alterations in the microbiota, thus leading to an alteration in the host's metabolome. Within the microbiota are functional bacteria with probiotic properties such as *Akkermansia*, which is known to be a Gram-negative intestinal commensal that uses host-derived mucins as a source of carbon and nitrogen, which is why they are a protective factor of the integrity of the intestinal barrier, since it increases mucus production due to the stimulation of beneficial mucous microbial networks, positively related to the decrease in the absorption of endotoxins into the circulation with the capacity to trigger liver disease. Therefore, it is a biomarker for health status

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by modulating energy homeostasis, glucose metabolism, inflammation related to obesity and even diabetes mellitus [4]. Although the mechanism by which ethanol compromises *Akkermansia muciniphila* is still unknown, ethanol alters its quantification as in the case of patients with alcoholic liver disease where its abundance is decreased [5]. In general, there is a decrease in the phylum of Gram-negative bacteria such as that of Bacteroidetes and the phylum Verrucomicrobia and a significant increase in the phyla Proteobacteria and Firmicutes [3]. A study carried out in mice directly reveals the protective effect of *A. muciniphila* in alcoholic liver disease against the breakdown of the barrier induced by ethanol, thus demonstrating the reduction of intestinal infiltration of endotoxins in the serum of mice fed with ethanol and a much thicker layer of mucus [5]. Ensuring that the Chinese baijiu drink has less systemic harmful effects and that *Akkermansia muciniphila* restores the intestinal barrier and therefore would be a collaborator in the treatment of alcoholic liver disease.

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