

## Protective Effect of Kombucha Tea on Liver Damage Induced by Thioacetamide in Rats

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**Abstract:** The aim of this study is to evaluate the possible protective effects of Kombucha tea against thioacetamide induced liver damage in rats. A total of 24 male Wistar rats were divided into four groups: Control, treated with thioacetamide (TAA) treated with TAA and then Kombucha tea, treated with Kombucha tea and then TAA; following 3 weeks of treatment. All the animals were killed and liver tissue samples were obtained for histopathological investigation. The data showed that TAA significantly increased aspartate aminotransferase (AST), alanine transaminase (ALT), alkaline phosphatase (ALP) and lactate dehydrogenase (LDH) but not bilirubin. The treatment by Kombucha tea promoted a significant reduction in serum enzyme levels AST, ALT, ALP, LDH and reduction in bilirubin content. The results show that the Kombucha tea has protective effects against the thioacetamide induced hepatotoxicity that might be due to antioxidant activities of these plants.

**Key words:** Hepatoprotective, thioacetamide, kombucha tea, rat

### INTRODUCTION

Liver is the most important organ which plays a pivotal role in regulating various physiological processes in the body. The liver is involved in several vital functions in human metabolism. Therefore, any damage to the liver induced by hepatotoxic agents is of grave consequences. Liver cirrhosis associated with various pathological processes, is characterized by progressive fibrosis producing liver injury, portal hypertension and carcinoma (Shahani, 1999). Thioacetamide (TAA) is a commonly used chemical compound to induce liver fibrosis that mimics human liver cirrhosis (Aydin *et al.*, 2010). TAA is a typical hepatotoxin, causing centrilobular necrosis. It induces apoptosis in the rat liver based on histochemical observations (Ledda-Columbano *et al.*, 1991).

Medicinal plants have been used from ancient times for wide variety diseases (Khosravi-Boroujeni *et al.*, 2012; Shirzad *et al.*, 2011; Shamsi *et al.*, 2011) as well as for hepatotoxicity (Kazemi *et al.*, 2010; Heidarian and Rafieian-Kopaei, 2012) and renal toxicity (Rafieian-Kopaei and Nasri, 2013; Baradaran *et al.*, 2013; Nasri *et al.*, 2013) induced by other drugs. Recent studies have also shown promising effects on different complications such as hypoglycemic (Behradmanesh *et al.*, 2012), antibacterial (Bahmani *et al.*, 2013; Sharafati-Chaleshtori *et al.*, 2011), lipid peroxidation (Madihi *et al.*, 2013; Heidarian *et al.*,

2013) and cancer (Shirzad *et al.*, 2009) prevention and these effects have mostly been attributed to their antioxidants and radical scavenging properties (Rafieian-Kopaei *et al.*, 2013a; Rafieian-Kopaei, 2012; Setorki *et al.*, 2012).

Kombucha tea is a traditional fermented beverage lightly sweetened effervescent drink of black tea that is produced by fermenting the tea using a symbiotic colony of yeast and bacteria (Teoh *et al.*, 2004). Kombucha is with a history of several thousand years in the East and yet is quite popular today in the West (Teoh *et al.*, 2004). Numerous studies refer to Kombucha's antimicrobial properties suggests that; it might influence the gastro-intestinal microbial flora of human body (Sreeramulu *et al.*, 2001). The beneficial properties of Kombucha tea is attributed to the presence of tea polyphenols, gluconic acid, glucuronic acid, lactic acid, vitamins, amino-acids, antibiotics and variety of micronutrients produced during fermentation. This beverage is reported to have medicinal effects against metabolic diseases, arthritis, indigestion and various types of cancer (Sreeramulu *et al.*, 2001). Recent studies suggest that Kombucha tea prevents paracetamol induced hepatotoxicity and chromate (VI) induced oxidative stress in rats (Pauline *et al.*, 2001). In this study the hepatoprotective effects of Kombucha tea were evaluated against TAA induced liver toxicity in Wistar rats.