



Haematological, biochemical and histopathological aspects of *Hericium erinaceus* ingestion in a rodent model: A sub-chronic toxicological assessment



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ABSTRACT

Ethnopharmacological relevance: *Hericium erinaceus* is a culinary-medicinal mushroom and has a long history of usage in traditional Chinese medicine as a tonic for stomach disorders, ulcers and gastrointestinal ailments.

Aim of the study: The present investigation was aimed to evaluate the potential toxic effects of the aqueous extract from the fruiting bodies of *H. erinaceus* in rats by a sub-chronic oral toxicity study.

Materials and methods: In this sub-chronic toxicity study, rats were orally administered with the aqueous extract of *H. erinaceus* (HEAE) at doses of 250, 500 and 1000 mg/kg body weight (b.w.) for 90 days. Body weights were recorded on a weekly basis and general behavioural changes were observed. The blood samples were subjected to haematological, biochemical, serum electrolyte, and antioxidant enzyme estimations. The rats were sacrificed and organs were processed and examined for histopathological changes.

Results: No mortality or morbidity was observed in all the treated and control rats. The results showed that the oral administration of HEAE daily at three different doses for 90 days had no adverse effect on the general behaviour, body weight, haematology, clinical biochemistry, and relative organ weights. Histopathological examination at the end of the study showed normal architecture except for few non-treatment related histopathological changes observed in liver, heart and spleen.

Conclusion: The results of this sub-chronic toxicity study provides evidence that oral administration of HEAE is safe up to 1000 mg/kg and *H. erinaceus* consumption is relatively non-toxic.

1. Introduction

The World Health Organization (WHO) has asserted that traditional medicines are relied upon by 65%–80% of the world's population for their primary health care needs (Gao and Watanabe, 2011). Natural products and herbal medicine are considered to be safe in view of long history of use in traditional medicine. Mushrooms are considered as nutritional functional foods and source of physiologically beneficial medicines. Of the 14,000 to 15,000 species of mushrooms in the world, around 700 have medicinal properties. However it has been estimated that there are about 1800 species of mushrooms that have medicinal attributes (Chang et al., 1999).

Hericium erinaceus (Bull.: Fr.) Pers., is a culinary-medicinal

mushroom that is also known as monkey's head mushroom or lion's mane mushroom (Hou Tou Gu in Chinese or Yamabushitake in Japanese), is commonly used as medicine or food and has attracted recent attention due to its multi-health benefits. The mushroom belongs to the class Agaricomycetes under the phylum basidiomycota. The mushroom is commonly found in the East Asian countries and has a long history of usage in traditional Chinese medicine for stomach disorders, ulcers and gastrointestinal ailments (Hiwatashi et al., 2010). Recent research on *H. erinaceus* has unearthed several medicinal values and reported widely to possess anti-cancer, anti-microbial, anti-diabetic, anti-hypertensive, antioxidant, gastro-protective, neuro-protective, immuno-modulating, and wound-healing properties (Abdulla et al., 2011; Kim et al., 2012, 2013; Shang et al., 2013; Wong et al.,

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