

## abstract

The incidence of obesity and related metabolic disease is increasing globally. Current medical treatments often fail to halt the progress of such disturbances, and plant derived polyphenols are increasingly being investigated as a possible way to provide safe and effective complementary therapy. Rooibos (*Aspalathus linearis*)

is a rich source of polyphenols without caloric and / or stimulant components. We have tentively characterized 25 phenolic compounds in rooibos extract and studied the effects of continuous aqueous rooibos extract consumption in mice. The effects of this extract, which contained 25% w/w of total polyphenol content, were negligible in animals with no metabolic disturbance but were significant in hyperlipemic mice, especially in those in which energy intake was increased via a Western-type diet that increased the risk of developing metabolic complications. In these mice, we found hypolipemiant activity when given rooibos extract, with significant reductions in serum cholesterol, triglyceride and free fatty acid concentrations. Additionally, we found changes in adipocyte size and number as well as complete prevention of dietary-induced hepatic steatosis. These effects were not related to changes in insulin resistance. Among other possible mechanisms, we present data indicating that the activation of AMP-activated protein kinase (AMPK) and their subsequent regulation of cellular energy homeostasis may play a significant role in these effects of rooibos extract. Our findings suggest that adding polyphenols to the daily diet is likely to help in the overall management of metabolic diseases.