



Abstract

In Vitro Hypolipidemic and Hypoglycaemic Properties of Mushroom Extracts [†]

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Abstract: Mushrooms are considered a valuable food due to their unique taste, nutritional properties, and biological effects [1]. They are a source of several classes of phytochemicals, including phenols, terpenoids, steroids, and polysaccharides that demonstrate a wide range of biological activities [2]. Obesity is a metabolic disorder, which results from the excessive accumulation of body fat, associated with several comorbidities, including cardiovascular diseases, hypertension, various types of cancer, and type 2 diabetes mellitus [3]. Several natural compounds possess the ability to reduce body weight and to prevent diet-induced obesity by inhibiting enzymes that interfere with the hydrolysis and absorption of dietary carbohydrates and lipids, such as alpha-amylase, alpha-glucosidase, and pancreatic lipase [4,5]. This study was constructed to investigate the hypoglycaemic and hypolipidemic activity of *Leccinum duriusculum* and *Lanmaoa fragrans* (= *Boletus fragrans*) from Calabria (southern Italy), two symbiotic edible mushrooms belonging to the Boletaceae family, growing the former in poplar tree forests and the latter in a mycorrhizal association with oaks. Both mushrooms were dried and exhaustively extracted by maceration with *n*-hexane, dichloromethane, and methanol. Extracts were investigated for their inhibitory activity against alpha-amylase, alpha-glucosidase, and lipase [6]. The best results against alpha-glucosidase and alpha-amylase were obtained with *L. duriusculum* methanol and dichloromethane extracts, respectively. The methanol extracts of both species exhibited the most promising results in inhibiting lipase (IC₅₀ of 35.02 and 22.40 µg/mL, for *L. duriusculum* and *L. fragrans*, respectively, vs. IC₅₀ of 37.63 µg/mL for the positive control orlistat). These data provided evidence that both species are able to inhibit key enzymes that interfere with the hydrolysis and absorption of dietary carbohydrates and lipids, suggesting their potential use for the development of new potential agents for the management of obesity and type 2 diabetes mellitus. However, further research is required to confirm these effects in vivo.

Keywords: mushrooms; extract; enzymes inhibition; type 2 diabetes; obesity



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