

Hyporcholesterolemic Activity of the Genus *Pleurotus* (Fr.) P. Karst. (Agaricales s.l., Basidiomycetes)

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Mushrooms of the genus *Pleurotus* are widespread in hardwood forests around the world. Since the beginning of their commercial cultivation, their popularity has increased mainly because of the ease of cultivation and nutritional value. Traditional medicine in Asia, Africa, and Central and South America attributed many different medicinal properties to *Pleurotus* spp., among others prevention of high blood pressure and atherosclerosis. Recent scientific evidence supports these ethnopharmaceutical beliefs.

Raised blood levels of low-density lipoprotein (LDL) cholesterol, as well as lowered levels of high-density lipoprotein (HDL) cholesterol, are identified as risk factors in the development of coronary artery disease, the main cause of morbidity in developed countries. It has been shown that the addition of 5% dried oyster mushroom to a high-cholesterol diet effectively reduces cholesterol accumulations in the serum and liver of rats, redistributes cholesterol in favor of HDL, reduces production of very low density lipoprotein (VLDL) and LDL, and reduces cholesterol absorption and activity of 3-hydroxy-3-methylglutaryl CoA (HMG CoA) reductase in liver.

The initial step in the prevention and treatment of coronary artery diseases (CAD) and hypercholesterolemia is the modification of the nutritional regimen with a special diet low in fats and saturated fatty acids and rich in crude fibers. Oyster mushrooms are a good source of non-

starchy carbohydrates, and have a very high dietary fiber content and a low caloric value. Their hypolipidemic efficiency was attributed mainly to the interaction of crude fibers and chitosan with bile acids in the small intestine, causing increased excretion and reduced enterohepatal circulation of bile acids and accelerating cholesterol catabolism by a feedback mechanism.

Inhibition of HMG CoA reductase, the major rate-limiting enzyme in the cholesterol biosynthesis pathway, is considered to be a prime target for pharmaceutical intervention. Mushrooms from the genus *Pleurotus* are able to synthesize mevinolin, the competitive inhibitor of HMG CoA reductase as well as other chemically related compounds. Their inhibitory effect was confirmed on HMG CoA reductase from Chinese Hamster Ovary (CHO-K1) cells.

A considerable reduction in VLDL and LDL cholesterol levels can be explained on the basis of the combined action of crude fibers and inhibition of HMG CoA reductase. The mechanism by which the oyster mushroom increases HDL concentration is not clear yet.

Although *Pleurotus* spp. are today widely consumed as food in the East and increasingly in the West, their use as health ingredients is still rather limited. They have an important commercial potential as a natural cholesterol-lowering agent and immunomodulatory substance, with antibiotic, antiviral, anticarcinogenic, and anti-inflammatory activities.