Ganoderma lucidum ('Lingzhi'); acute and short-term biomarker response to supplementation.

Wachtel-Galor S¹, Szeto YT, Tomlinson B, Benzie IF.

Abstract

Ganoderma lucidum (Lingzhi) is a popular Chinese herb with an impressive array of reputed health benefits, including antioxidant properties. However, these require scientific validation. The aim of this study was to investigate in vitro antioxidant capacity of Lingzhi, absorption and systemic distribution of Lingzhi antioxidants, and effects of short-term (10 days) supplementation on biomarkers of antioxidant status, coronary heart disease (CHD) risk and DNA damage. In this double-blinded, placebo-controlled, cross-over intervention study, blood and urine samples were collected from 10 healthy volunteers at 0 (fasting) and 45, 90, 135 and 180 min post-ingestion of a single dose (1.1g) of Lingzhi. Repeat fasting samples were collected after 10 days' supplementation with 0.72 g/d Lingzhi. The acute response (up to 3 hours) was also investigated with a larger dose (3.3 g) of Lingzhi (n=7). Results showed that the total antioxidant capacity (as the FRAP value) of an aqueous suspension of Lingzhi was 360 micromol/g. Ingestion of Lingzhi caused a significant post-ingestion increase (mean+/-SEM 23+/-3 micromol/L; P<0.05) in plasma antioxidant capacity, with peak response at 90 min. Average increase of 29+/-11% (P<0.05) in urine antioxidant capacity was seen within 3 hours of ingestion. After 10 days' supplementation with 0.72 g per day of Lingzhi, fasting plasma lipid standardised alpha-tocopherol concentration and urine antioxidant capacity increased (P<0.05). Fasting plasma ascorbic acid and total alpha-tocopherol concentrations and erythrocyte SOD and GPx activities increased slightly but non-significantly with supplementation. Plasma lipids and uric acid tended to decrease, but changes were not statistically significant. No discernable differences were seen in other variables measured. Results indicate that Lingzhi intake causes an acute increase in plasma antioxidant capacity. No deleterious effects on measured variables were seen. The pattern of biomarker response after supplementation indicated possible benefit in terms of antioxidant status and CHD risk, but further study is needed to elucidate the nature and longer-term effects of the absorbable antioxidants from Lingzhi.
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