

Short and Long-Term Physiological Responses of Male and Female Rats to Two Dietary levels of Pre-Gelatinized Maca (*Lepidium Peruvianum* Chacon)

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ABSTRACT

Objective: The aim of this study is to identify physiological responses of male and female rats to either a short- or long-term administration of two doses of Maca (*Lepidium peruvianum*) and observe relationships which may exist between groups of hormones and effects mediated by them.

Design: The effect of pre-gelatinized (extruded) organic Maca powder (Maca-GO) was studied on Sprague-Dowley male and female rats (1:1 ratio) receiving two dietary levels of Maca-GO (0.75g/kg and 7.5g/kg body weight) and assessed against control during 28 and 90 day laboratory trials on 30 and 60 rats respectively. Blood morphology, biochemistry (hormones, lipids and minerals) and histology of internal organs were determined. Homogenates of skeletal muscles and bones of rats were also analyzed.

Results: Maca-GO has low toxicity (LD=7.5g/kg) and appears to be safe for short-term and extended use as dietary supplement or as a component of functional dietary and therapeutic preparations.

There were different responses of male and female rats to different levels of Maca-GO administered during a short- and a longer-term period. When administered at higher dose for extended period of time (90 days), Maca-GO acted as a toner of hormonal processes in adult female rats at increased progesterone and a steady estradiol level, without affecting levels of blood FSH, LH and TSH.

Conclusions: Obtained results justify further clinical research on use of Maca-GO in sportsmen, physically-active people of both sexes and peri-menopausal women to clarify mechanisms underlying physiological mode of action of Maca-GO validated in clinical study on humans.

Substantial decrease in blood cortisol levels in a short- and longer-term trial and simultaneous tendency to lower blood ACTH, may indicate antidepressive effect of Maca-GO, which together with reduction in body weight, lowering triglycerides in blood plasma and increasing calcium and phosphorus deposition in bone and muscle tissues is worthy consideration in potential application to women at both, pre- and postmenopausal stage.

Short title: Effect of Maca (*Lepidium peruvianum*) in Rats

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