Hormone-balancing Effect of Pre-Gelatinized Organic Maca (Lepidium peruvianum Chacon) in Postmenopausal Women:
(I) Biochemical and Pharmacodynamic Study on Maca using Clinical Laboratory Model on Ovariectomized Rats

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ABSTRACT

Background: Roots of high Andean cruciferous plant Maca (Lepidium peruvianum Chacon) has been recognized by natives of Peru as herbal remedy helping to treat conditions affecting menopausal women. Recent laboratory and preliminary clinical study on Maca provide indications of its hormone-balancing properties in menopausal women.

Objective: To examine biochemical and pharmacodynamic effects of pre-gelatinized organic preparation of Lepidium peruvianum Chacon (Maca-GO) in a model laboratory study using ovariectomized rats.

Design: Biochemical and Pharmacodynamic effects of Maca-GO (250mg Maca-GO per kg body weight (bw) administered by intubation twice daily) were assessed in a 28-day model laboratory study on ovariectomized (by laparoscopy) Wistar rats with pharmacodynamic tests performed at the conclusion of the trial followed by blood collection for morphology and biochemical tests.

Methods: Toxicity of Maca-GO used in the study was determined in bioassay on mice and rats. Anti-depressive function (Porsolt’s test) and anxiolytic sedative and cognitive effects (using elevated-plus maze, locomotor activity and passive avoidance tests) were assessed against control (laparotomized female rats with intact ovaries). In addition to blood morphology, the following blood serum constituents were analyzed: Estrogen (E2), Progesterone (PGS), Cortisol (CT), Adrenocorticotropic Hormone (ACTH), Thyroid Hormones (TSH, T3, and T4), Iron (Fe) and lipid profile (Triglycerides, Total Cholesterol, LDL, HDL).

Results: Analytically-determined non-toxic status of Maca-GO was confirmed in bioassays when applied to mice and rats at levels of 0.5 and up to 15mg/kg bw which shows it safe use in humans with the LD50 >15mg/kg bw Maca-GO showed a distinctive, (P<0.05) antidepressant-like and sedative effect in ovariectomized rats only, while there was no anxiolytic activity nor disturbance of cognitive function observed in both, test and control animals.

Conclusion: Observed in this study balancing effect of Maca-GO on sex hormone levels show its potential as a safe preparation for use in correcting physiological symptoms characteristic in postmenopausal stage, with an indication of potentially even more value for its use in pre-menopausal women.

Short title: Pre-Gelatinized Maca in Postmenopausal Women: (I) Pharmacodynamic Study

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