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HERBAL INGREDIENTS: MACA
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Although during the last decade a significant progress have been made in the field of male infertility, and sexual insufficiency, the ideal treatment for these health issues has not been identified. In fact, some of the available oral drugs (such as sildenafil and tadalafil) have been shown to result in several adverse effects, including risk of cancer, headache, and sometimes cause drug cessation. Also, in some cases, there are risks of drug interactions that are life-threatening. The use of drugs in this group is contraindicated due to the occurrence of unpredictable hypotension. Additionally, current pharmacological interventions for the management of sexual problems are recommended for erectile dysfunction but has no or little impact on men semen quality. Due to these reasons, current pharmacological interventions for the management of infertility and sexual problems are very inadequate with limited scope.

Undoubtedly, the most preferred product by men affected by subfertility or ED is a product that could improve their sexual function (including sperms quality) with the minimum side effects. Therefore, the use of a natural product that has got a good efficacy on the erection, sperms quality and on the sexual desire could be the right way to manage sexual dysfunction. Herbal therapies for sexual dysfunction include many herbs such as Tongkat Ali, Maca, Tribulus terrestris, and Horny Goat Weed. Nowadays various Chinese herbs are used for patients with ED in clinical practice and show satisfying outcomes. Result of some basic studies showed that some herbs could improve erectile function

Fortunately, recently, several well-designed clinical studies have been conducted to assess the efficacy of many herbs. The following articles are summarizing the most effective and allowed herbs which are classified as aphrodisiac. This article on the herb “Maca” only

MACA (LEPIDIUM MEYENII)

Preparations from the Maca root have been reported to improve sexual function in healthy subjects. The hypothesis that Maca may be effective in improving sexual function is supported by several lines of evidence. Animal experiments suggest that Maca has spermatogenic and fertility enhancing activities, which are likely due to the phytosterols or phytoestrogens present in Maca (Byung-Cheul Shin et al. 2010).

Recent clinical trials have also suggested significant effects of Maca for increasing sperm count and mobility and improving sexual function in humans. The potential bioactive ingredients in Maca include macaridine, macamides, and Maca alkaloid. Below is the evidence

from randomised clinical trials (RCTs) for the effectiveness of Maca in the improvement of sexual function, including sexual desire and sexual responses.

1. CLINICAL TRIAL: A DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED STUDY

Products of *Lepidium meyenii*. (Maca) are advertised worldwide as a supplement to enhance fertility and restore hormonal balance. This study is a double-blind, randomized, placebo-controlled trial to evaluate the effects of Maca on semen parameters and serum hormone levels in healthy adult men. A group of 20 volunteers aged 20-40 years was supplied by 1.75 g/day of Maca or placebo for 12 weeks. It has been found that sperm concentration and motility showed rising trends compared to placebo even though levels of hormones did not change significantly after 12 weeks of trial. Authors concluded that the study results indicate that Maca possesses fertility enhancing properties in men,

Reference: Ingrid Melnikovova et al. Effect of *Lepidium meyenii* Walp. on Semen Parameters and Serum Hormone Levels in Healthy Adult Men: A Double-Blind, Randomized, Placebo-Controlled Pilot Study. Evidence-Based Complementary and Alternative Medicine. Volume 2015, Article ID 324369, 6 pages

2. CLINICAL TRIAL: A DOUBLE-BLIND CLINICAL TRIAL

Workers carried out a double-blind clinical trial on 50 Caucasian men affected by mild erectile dysfunction (ED), randomised to treatment with Maca dry extract, 2400 mg, or placebo. The treatment effect on ED and subjective well-being was tested. After 12 weeks of treatment, both Maca- and placebo-treated patients experienced a significant increase in International Index of Erectile Function (IIEF-5) score. However, patients taking Maca experienced a more significant increase than those taking placebo. Both Maca- and placebo-treated subjects experienced a significant improvement in psychological performance-related the Satisfaction Profile (SAT-P) score, but the Maca group higher than that of placebo group. However, only Maca-treated patients experienced a significant improvement in physical and social performance-related SAT-P score compared with the baseline. In conclusion, study results support a small but significant effect of Maca supplementation on subjective perception of general and sexual well-being in adult patients with mild ED.

Reference: T. Zenico et al. Subjective effects of *Lepidium meyenii* (Maca) extract on well-being and sexual performances in patients with mild erectile dysfunction: a randomised, double-blind clinical trial *Andrologia* 41, 95-99 (2008)

3. CLINICAL: DOUBLE BLIND PLACEBO-CONTROLLED, RANDOMIZED, PARALLEL TRIAL

This study was a 12-week double blind placebo-controlled, randomized, parallel trial in which active treatment with different doses of Maca was compared with placebo. The study aimed to demonstrate if effect of Maca on subjective report of sexual desire was

because of effect on mood or serum testosterone levels. Men aged 21-56 years received Maca in one of two doses: 1500 mg or 3000 mg or placebo. Self perception on sexual desire, score for Hamilton test for depression, and Hamilton test for anxiety were measured at 4, 8 and 12 weeks of treatment.

An improvement in sexual desire was observed with Maca for 8 weeks of treatment. Serum testosterone and oestradiol levels were not different in men treated with Maca and in those treated with placebo. Logistic regression analysis showed that Maca has an independent effect on sexual desire at 8 and 12 weeks of treatment, and this effect is not because of changes in either Hamilton scores for depression or anxiety or serum testosterone and oestradiol levels. In conclusion, Maca improved sexual desire.

Reference: G. F. Gonzales, et al. Effect of *Lepidium meyenii* (Maca) on sexual desire and its absent relationship with serum testosterone levels in adult healthy men. *Andrologia* 34, 367-372 (2002)

4. CLINICAL TRIAL: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

The aim of this research was to provide results on some health effects of oral administration of black or red Maca (*Lepidium meyenii*) in adult human subjects living at low (LA) and high altitude (HA). A total of 175 participants were given 3 g of either placebo, black, or red Maca extract daily for 12 weeks. Primary outcomes were changes in sexual desire, mood, energy, health-related quality of life score (HRQL). Workers concluded that Maca extract consumption relative to the placebo improved quality of life parameters.

Reference: Carla Gonzales-Arimborgo et al. Acceptability, Safety, and Efficacy of Oral Administration of Extracts of Black or Red Maca (*Lepidium meyenii*) in Adult Human Subjects: A Randomized, Double-Blind, Placebo-Controlled Study. *Pharmaceuticals* 2016, 9, 49

5. CLINICAL TRIAL

This study was designed to determine the effect of oral treatment with tablets of *Lepidium meyenii* (Maca) on seminal analysis in nine adult normal men aged 24-44 years old. Men received tablets of Maca (1500 or 3000 mg/day) for 4 months. Seminal analysis was performed according to guidelines of the World Health Organization (WHO). Serum luteinizing hormone (LH), follicle stimulating hormone (FSH), prolactin (PRL), testosterone (T) and estradiol (E_2) were measured before and after treatment. Workers concluded that treatment with Maca resulted in increased seminal volume, sperm count per ejaculum, motile sperm count, and sperm motility by mechanisms not related to LH, FSH, PRL, T and E_2 . (Serum hormone levels were not modified with Maca treatment).

Reference: Gustavo F. Gonzales et al. *Lepidium meyenii* (Maca) improved semen parameters in adult men. *Asian J Androl* 2001 Dec; 3: 301-303