MACA

A double-blind, randomized, pilot dose-finding study of maca root (L. meyenii) for the management of SSRI-induced sexual dysfunction.

CNS Neurosci Ther 2008 Fall;14(3):182-91 (ISSN: 1755-5930)

Dording CM; Fisher L; Papakostas G; Farabaugh A; Sonawalla S; Fava M; Mischoulon D

We sought to determine whether maca, a Peruvian plant, is effective for selective-serotonin reuptake inhibitor (SSRI)-induced sexual dysfunction. We conducted a double-blind, randomized, parallel group dose-finding pilot study comparing a low-dose (1.5 g/day) to a high-dose (3.0 g/day) maca regimen in 20 remitted depressed outpatients (mean age 36+/13 years; 17 women) with SSRI-induced sexual dysfunction. The Arizona Sexual Experience Scale (ASEX) and the Massachusetts General Hospital Sexual Function Questionnaire (MGH-SFQ) were used to measure sexual dysfunction. Ten subjects completed the study, and 16 subjects (9 on 3.0 g/day; 7 on 1.5 g/day) were eligible for intent-to-treat (ITT) analyses on the basis of having had at least one postbaseline visit. ITT subjects on 3.0 g/day maca had a significant improvement in ASEX (from 22.8+/3.8 to 16.9+/6.2; z=-2.20, P=0.028) and in MGH-SFQ scores (from 24.1+/1.9 to 17.0+/5.7; z=-2.39, P=0.017), but subjects on 1.5 g/day maca did not. Libido improved significantly (P <0.05) for the ITT and completer groups based on ASEX item #1, but not by dosing groups. Maca was well tolerated. Maca root may alleviate SSRI-induced sexual dysfunction, and there may be a dose-related effect. Maca may also have a beneficial effect on libido.

Lepidium meyenii (Maca) increases litter size in normal adult female mice.

Reprod Biol Endocrinol 2005;3:16 (ISSN: 1477-7827)

Ruiz-Luna AC; Salazar S; Aspajo NJ; Rubio J; Gasco M; Gonzales GF

BACKGROUND: Lepidium meyenii, known as Maca, grows exclusively in the Peruvian Andes over 4000 m altitude. It has been used traditionally to increase fertility. Previous scientific studies have demonstrated that Maca increases spermatogenesis and epididymal sperm count. The present study was aimed to investigate the effects of Maca on several fertility parameters of female mice at reproductive age. METHODS: Adult female Balb/C mice were divided at random into three main groups: i) Reproductive indexes group, ii) Implantation sites group and iii) Assessment of uterine weight in ovariectomized mice. Animals received an aqueous extract of lyophilized Yellow Maca (1 g/Kg BW) or vehicle orally as treatment. In the fertility indexes study, animals received the treatment before, during and after gestation. The fertility index, gestation index, post-natal viability index, weaning viability index and sex ratio were calculated. Sexual maturation was evaluated in the female pups by the vaginal opening (VO) day. In the implantation study, females were checked for implantation sites at gestation day 7 and the embryos were counted. In ovariectomized mice, the uterine weight was recorded at the end of treatment. RESULTS: Implantation sites were similar in mice treated with Maca and in controls. All
reproductive indexes were similar in both groups of treatment. The number of pups per dam at birth and at postnatal day 4 was significantly higher in the group treated with Maca. VO day occurred earlier as litter size was smaller. Maca did not affect VO day. In ovariectomized mice, the treatment with Maca increased significantly the uterine weights in comparison to their respective control group. CONCLUSION: Administration of aqueous extract of Yellow Maca to adult female mice increases the litter size. Moreover, this treatment increases the uterine weight in ovariectomized animals. Our study confirms for the first time some of the traditional uses of Maca to enhance female fertility.

**Effect of Lepidium meyenii (Maca), a root with aphrodisiac and fertility-enhancing properties, on serum reproductive hormone levels in adult healthy men.**

J Endocrinol 2003 Jan;176(1):163-8 (ISSN: 0022-0795)

Gonzales GF; Cordova A; Vega K; Chung A; Villena A; Gonez C

Lepidium meyenii (Maca) is a Peruvian hypocotyl that grows exclusively between 4000 and 4500 m in the central Andes. Maca is traditionally employed in the Andean region for its supposed aphrodisiac and/or fertility-enhancing properties. This study was a 12-week double-blind, placebo-controlled, randomized, parallel trial in which active treatment with different doses of Maca Gelatinizada was compared with a placebo. The study aimed to test the hypothesis that Maca has no effect on serum reproductive hormone levels in apparently healthy men when administered in doses used for aphrodisiac and/or fertility-enhancing properties. Men aged between 21 and 56 Years received 1500 mg or 3000 mg Maca. Serum levels of luteinizing hormone, follicle-stimulating hormone, prolactin, 17-alpha hydroxyprogesterone, testosterone and 17-beta estradiol were measured before and at 2, 4, 8 and 12 weeks of treatment with placebo or Maca (1.5 g or 3.0 g per day). Data showed that compared with placebo Maca had no effect on any of the hormones studied nor did the hormones show any changes over time. Multiple regression analysis showed that serum testosterone levels were not affected by treatment with Maca at any of the times studied (P, not significant). In conclusion, treatment with Maca does not affect serum reproductive hormone levels.

**Effect of Lepidium meyenii (MACA) on sexual desire and its absent relationship with serum testosterone levels in adult healthy men.**

Andrologia 2002 Dec;34(6):367-72 (ISSN: 0303-4569)

Gonzales GF; Cordova A; Vega K; Chung A; Villena A; Gonez C; Castillo S.

This study was a 12-week double blind placebo-controlled, randomized, parallel trial in which active treatment with different doses of Maca Gelatinizada 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: 1,500 mg or 3,000 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 since 8 weeks of treatment. Serum testosterone and oestradiol levels were not different in men treated with Maca and in those treated with placebo (P:NS).
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, treatment with Maca improved sexual desire.

*Maca (Lepidium meyenii) for treatment of menopausal symptoms: A systematic review.*

Maturitas 2011 Nov;70(3):227-33 (ISSN: 1873-4111)

Lee MS; Shin BC; Yang EJ; Lim HJ; Ernst E

Maca (Lepidium meyenii), an Andean plant of the brassica (mustard) family has been used for centuries in the Andes as an adaptogenic plant to manage anemia, infertility and female hormone balance. The aim of this review was to assess the evidence for and against the effectiveness of the maca plant as a treatment for menopausal symptoms. We searched 17 databases from their inception up to June 2011 and included all randomized clinical trials (RCTs) that compared any type of maca-based intervention to a placebo for the treatment of menopausal symptoms. All studies were assessed for methodological quality using the Cochrane 'risk of bias' assessment tool. Four RCTs met all inclusion criteria. These RCTs tested the effects of maca on menopausal symptoms in healthy perimenopausal, early postmenopausal, and late postmenopausal women. Using the Kupperman Menopausal Index and the Greene Climacteric Score, all RCTs demonstrated favorable effects of maca. There have been very few rigorous trials of maca for menopausal symptoms. The results of our systematic review provide limited evidence for the effectiveness of maca as a treatment for menopausal symptoms. However, the total number of trials, the total sample size, and the average methodological quality of the primary studies, were too limited to draw firm conclusions. Furthermore, the safety has not been proved yet. Therefore, the efficacy and safety should be tested in larger studies. [Copyright 2011 Elsevier Ireland Ltd. All rights reserved.].

*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 2009 Apr;41(2):95-9 (ISSN: 1439-0272)

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Lepidium meyenii (Maca) is a cultivated root belonging to the brassica family used in the Andean region for its supposed aphrodisiac properties. We 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 administrating before and after 12
weeks the International Index of Erectile Function (IIEF-5) and the Satisfaction Profile (SAT-P). After 12 weeks of treatment, both Maca- and placebo-treated patients experienced a significant increase in IIEF-5 score (P < 0.05 for both). However, patients taking Maca experienced a more significant increase than those taking placebo (1.6 +/- 1.1 versus 0.5 +/- 0.6, P < 0.001). Both Maca- and placebo-treated subjects experienced a significant improvement in psychological performance-related SAT-P score, but the Maca group higher than that of placebo group (+9 +/- 6 versus +6 +/- 5, P < 0.05). However, only Maca-treated patients experienced a significant improvement in physical and social performance-related SAT-P score compared with the baseline (+7 +/- 6 and +7 +/- 6, both P < 0.05). In conclusion, our data support a small but significant effect of Maca supplementation on subjective perception of general and sexual well-being in adult patients with mild ED.

**Beneficial effects of Lepidium meyenii (Maca) on psychological symptoms and measures of sexual dysfunction in postmenopausal women are not related to estrogen or androgen content.**


Brooks NA; Wilcox G; Walker KZ; Ashton JF; Cox MB; Stojanovska L

OBJECTIVE: To examine the estrogenic and androgenic activity of Lepidium meyenii (Maca) and its effect on the hormonal profile and symptoms in postmenopausal women. DESIGN: Fourteen postmenopausal women completed a randomized, double-blind, placebo-controlled, crossover trial. They received 3.5 g/day of powered Maca for 6 weeks and matching placebo for 6 weeks, in either order, over a total of 12 weeks. At baseline and weeks 6 and 12 blood samples were collected for the measurement of estradiol, follicle-stimulating hormone, luteinizing hormone, and sex hormone-binding globulin, and the women completed the Greene Climacteric Scale to assess the severity of menopausal symptoms. In addition, aqueous and methanolic Maca extracts were tested for androgenic and estrogenic activity using a yeast-based hormone-dependent reporter assay. RESULTS: No differences were seen in serum concentrations of estradiol, follicle-stimulating hormone, luteinizing hormone, and sex hormone-binding globulin, and the women completed the Greene Climacteric Scale to assess the severity of menopausal symptoms. In addition, aqueous and methanolic Maca extracts were tested for androgenic and estrogenic activity using a yeast-based hormone-dependent reporter assay. RESULTS: No differences were seen in serum concentrations of estradiol, follicle-stimulating hormone, luteinizing hormone, and sex hormone-binding globulin between baseline, Maca treatment, and placebo (P > 0.05). The Greene Climacteric Scale revealed a significant reduction in scores in the areas of psychological symptoms, including the subscales for anxiety and depression and sexual dysfunction after Maca consumption compared with both baseline and placebo (P < 0.05). These findings did not correlate with androgenic or alpha-estrogenic activity present in the Maca as no physiologically significant activity was observed in yeast-based assays employing up to 4 mg/mL Maca extract (equivalent to 200 mg/mL Maca). CONCLUSIONS: Preliminary findings show that Lepidium meyenii (Maca) (3.5 g/d) reduces psychological symptoms, including anxiety and depression, and lowers measures of sexual dysfunction in postmenopausal women independent of estrogenic and androgenic activity.

**Ethnobiology and Ethnopharmacology of Lepidium meyenii (Maca), a Plant from the**
Peruvian Highlands.

Gonzales GF.

Lepidium meyenii (maca) is a Peruvian plant of the Brassicaceae family cultivated for more than 2000 years, which grows exclusively in the central Andes between 4000 and 4500vm altitude. Maca is used as a food supplement and also for its medicinal properties described traditionally. Since the 90s of the XX century, an increasing interest in products from maca has been observed in many parts of the world. In the last decade, exportation of maca from Peru has increased from 1,415,000 USD in 2001 to USD 6,170,000 USD in 2010. Experimental scientific evidence showed that maca has nutritional, energizer, and fertility-enhancer properties, and it acts on sexual dysfunctions, osteoporosis, benign prostatic hyperplasia, memory and learning, and protects skin against ultraviolet radiation. Clinical trials showed efficacy of maca on sexual dysfunctions as well as increasing sperm count and motility. Maca is a plant with great potential as an adaptogen and appears to be promising as a nutraceutical in the prevention of several diseases.

A pilot investigation into the effect of maca supplementation on physical activity and sexual desire in sportsmen.

Stone M; Ibarra A; Roller M; Zangara A; Stevenson E

AIMS OF THE STUDY: Maca (Lepidium meyenii Walp) is consumed both as a sports supplement by strength and endurance athletes, and as a natural stimulant to enhance sexual drive. However, whether or not the postulated benefits of maca consumption are of scientific merit is not yet known. The aim of the study was therefore to investigate the effect of 14 days maca supplementation on endurance performance and sexual desire in trained male cyclists. MATERIALS AND METHODS: Eight participants each completed a 40 km cycling time trial before and after 14 days supplementation with both maca extract (ME) and placebo, in a randomised cross-over design. Subjects also completed a sexual desire inventory during each visit. RESULTS: ME administration significantly improved 40 km cycling time trial performance compared to the baseline test (P=0.01), but not compared to the placebo trial after supplementation (P>0.05). ME administration significantly improved the self-rated sexual desire score compared to the baseline test (P=0.01), and compared to the placebo trial after supplementation (P=0.03). CONCLUSIONS: 14 days ME supplementation improved 40 km cycling time trial performance and sexual desire in trained male cyclists. These promising results encourage long-term clinical studies involving more volunteers, to further evaluate the efficacy of ME in athletes and normal individuals and also to explore its possible mechanisms of action.
**Hormones, herbal preparations and nutriceuticals for a better life after the menopause**


Comhaire FH1, Depypere HT

Long-term estrogen replacement therapy with estrogen has benefits for many postmenopausal women. However, some women prefer non-steroidal substitution with herbal preparations. The effectivity against vasomotor symptoms has been evidenced for the extracts of pine bark, of linseed and of Lepidium meyenii (Maca), whereas there is controversy about the effectiveness of genistein-rich soy extract. The extracts of cruciferous vegetables such as Broccoli and of linseed induce changes in the metabolism of estrogens, and antioxidants may reverse altered epigenetic DNA methylation, possibly reducing the risk of breast cancer or its recurrence. Indirect evidence from the literature and from clinical trials supports that a nutriceutical composed of plant extracts, low-dose vitamins and minerals may improve the quality of life by delaying certain age-related diseases. On the basis of epidemiologic studies, physiopathological considerations and controlled prospective trials, it is suggested that transdermal substitution therapy with estradiol together with nutriceutical food supplementation may increase the number of quality-adjusted life years of postmenopausal women, but complementary, large-scale, prospective trials are still needed.

**Maca reduces blood pressure and depression, in a pilot study in postmenopausal women.**


Objective: Lepidium meyenii (Maca) has been used for centuries for its fertility-enhancing and aphrodisiac properties. In an Australian study, Maca improved anxiety and depressive scores. The effects of Maca on hormones, lipids, glucose, serum cytokines, blood pressure, menopausal symptoms and general well-being in Chinese postmenopausal women were evaluated. Methods: A randomized, double-blind, placebo-controlled, cross-over study was conducted in 29 postmenopausal Hong Kong Chinese women. They received 3.3 g/day of Maca or placebo for 6 weeks each, in either order, over 12 weeks. At baseline, week 6 and week 12, estradiol, follicle stimulating hormone (FSH), sex hormone binding globulin (SHBG), thyroid stimulating hormone (TSH), full lipid profiles, glucose and serum cytokines were measured. The Greene Climacteric, SF-36 Version 2, Women's Health Questionnaire and Utian Quality of Life Scales were used to assess the severity of menopausal symptoms and health-related quality of life. Results:
There were no differences in estradiol, FSH, TSH, SHBG, glucose, lipid profiles and serum cytokines amongst those who received Maca as compared to the placebo group; however, significant decreases in diastolic blood pressure and depression were apparent after Maca treatment. Conclusions: Maca did not exert hormonal or immune biological action in the small cohort of patients studied; however, it appeared to reduce symptoms of depression and improve diastolic blood pressure in Chinese postmenopausal women. Although results are comparable to previous similar published studies in postmenopausal women, there might be a cultural difference among the Chinese postmenopausal women in terms of symptom reporting.