



UNLOCKING THE THERAPEUTIC POTENTIAL OF LEPIDIUM MEYENNI

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Abstract:

Lepidium meyenii walp, often known as common maca or peruvian ginseng, is a herbal medicine belongs to the Brassicaceae family. This plant is native to the Andes Mountains of central Peru, which is cultivated as a root vegetable and is yellow or black in colour. Maca root has many benefits including alleviate menopause symptoms, improve mood and energy, depression, improves bone strength, improves learning and memory. It contains fiber, vitamins, minerals, macamides, macaridine, alkaloids, and glucosinolates. This article provides an in-depth review of the herb's pharmacological properties, showcasing its potential as a promising treatment option for a range of respiratory and rheumatic disorders.

KeyPoints: Menstrual Problems, Maca herb, Ginseng herb

Introduction:

The menstrual cycle in women is characterized by high variability in cycle length (26–35 days), 5-day menses, a fertile phase from 5 days before to the day of ovulation, and low fertility which is dependent on cycle length and age.^[1] Women have a long reproductive lifespan of an average 36 years, from menarche at 8.5 to 13 years to menopause (defined as 1 year of anovulation) at around 51 years.^[2]

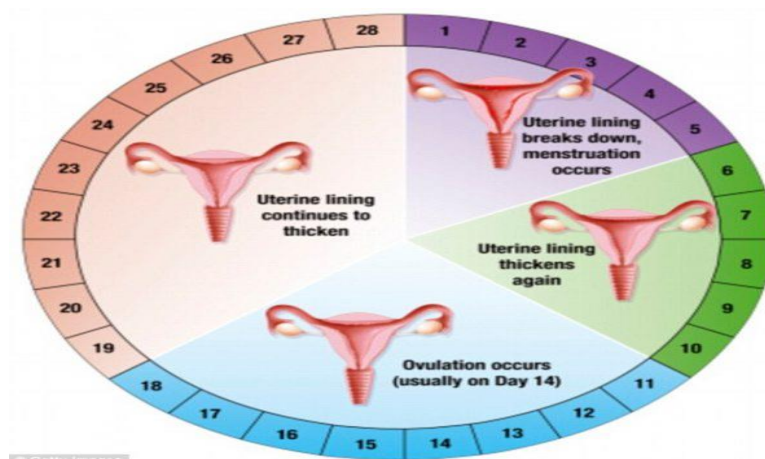


Figure 1: Menstrual cycle

Normal ovulation and menstruation occur as a result of the pulsatile release of Gonadotropin-releasing hormone (GnRH) from the hypothalamus, which stimulates the secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) by the anterior pituitary. LH and FSH act directly on ovarian cells, resulting in the production of ovarian androgens and estradiol; FSH is additionally responsible for the recruitment of ovarian follicles and follicular growth. [3]

How Maca herb is helpful in Menstrual Problems?

A healthy reproductive system is reflected in a regular menstrual cycle. Research has identified obesity, stress, and smoking as key factors linked to irregular periods and early menopause. [4] A menstrual cycle is considered irregular if it lasts less than 21 days or more than 35 days, and is accompanied by abnormally light or heavy bleeding.

Hormonal imbalances, specifically fluctuations in estrogen and progesterone levels, can disrupt the normal menstrual pattern. [5] Irregular periods have been linked to various health issues, including metabolic syndrome, coronary heart disease, type 2 diabetes, and rheumatoid arthritis, as well as anemia, osteoporosis, psychological problems, reduced quality of life, and infertility.

Notably, the number of women experiencing difficulties conceiving rose to 160,000 in 2014, marking a significant 65% increase over the previous decade. [6][7] Dietary habits play a crucial role in shaping human lifestyles and individual quality of life (QOL). Moreover, the detrimental impact of environmental hormones and toxins on human health, which may become apparent later in life, has been highlighted.

Researchers often define a normal menstrual cycle as one lasting between 25-28 to 32 days, excluding women with irregular periods to ensure a narrow range of menstrual intervals. [8] A study on postmenopausal women found that those with both irregular menstrual cycles and bleeding patterns had a twofold increased risk of hip fractures compared to those without such irregularities. [9]

Women is used to assess menopausal symptoms such as hot flushes, night sweats, fast heart rate and difficulty falling asleep. [10]

Maca herb has been shown to alleviate menopausal symptoms, with most women experiencing significant relief from typical discomforts, including reduced:

- Nervousness and anxiety
- Sleep disturbances, with improved ability to fall asleep
- Cognitive fogginess, with enhanced concentration and focus
- Fatigue, with increased energy levels
- Numbness and headaches
- Night sweats [11]

Additionally, maca supplementation has been found to lower levels of thyroid-stimulating hormone (TSH) in both short-term and long-term use, further supporting its benefits for menopausal women. [12][13]

According to a recent study, between 1300 and 2000 years ago, the Andean population appreciated the maca (*Lepidium meyenii* Walp [Brassicaceae]) plant for its nutritional and therapeutic properties. [14][15]



Figure 2: Symptoms of menopause

Introduction to Maca herb :-

Lepidium meyenii Walp, commonly known as Maca or Peruvian Ginseng, is a plant that belongs to the Brassicaceae family. It is a perennial plant native to the Andean region of Peru and is widely used in traditional medicine. This plant is native to the Andes Mountains of central Peru, which is cultivated as a root vegetable and is yellow or black in colour. ^[16]

On the Tibet Plateau, *Lepidium meyenii* Walp. is grown at altitudes above 3,000 meters. The primary compounds responsible for Maca's anti-fatigue effects are macamides, which owe their benefits to potent antioxidant and anti-inflammatory properties. ^[17]

Biological name: *Lepidium meyenii walp*

Family : Brassicaceae

Common name : Ginseng Andin, Peruvian Ginseng, *Lepidium peruvianum*.

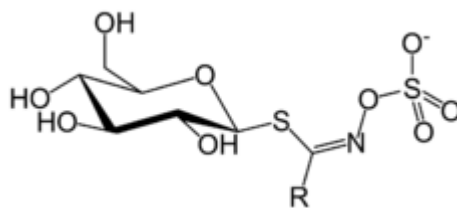
Part used : Root



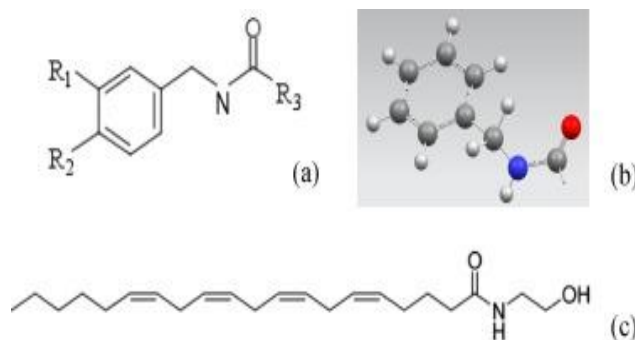
Smell :
Figure 3: Maca Root

Similar to Butterscotch ^[18]
Figure 4: Maca plant

1. Maca (*Lepidium meyenii*) is a plant that contains a variety of bioactive compounds, including: Glucosinolates: Maca contains a range of glucosinolates, including benzyl glucosinolate, p-methoxybenzyl glucosinolate, and indole-3-ylmethyl glucosinolate ^[19].

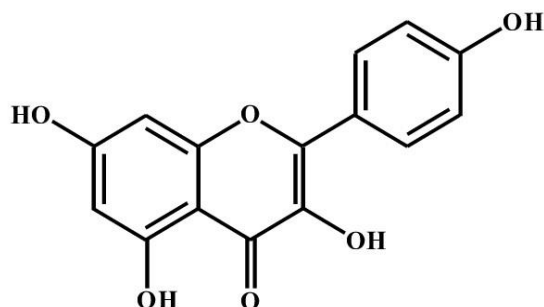


2. Alkaloids: Maca contains several alkaloids, including macamides, macaenes, and leptidiline ^[20].

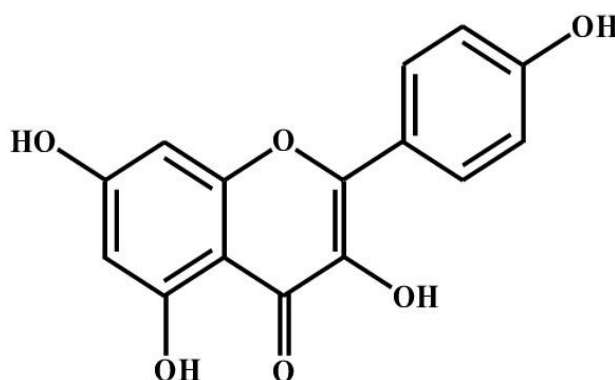


3. Saponins: Maca contains saponins, which are known for their antioxidant and anti-inflammatory properties ^[21].

4. Flavonoids: Maca contains flavonoids, including kaempferol and quercetin [22].



5. Phenolic acids: Maca contains phenolic acids, including ferulic acid and caffeic acid [23]



6. Minerals: Maca is rich in minerals, including calcium, magnesium, and iron [24].

7. Amino acids: Maca contains a range of amino acids, including aspartic acid, glutamic acid, and arginine [25].

Maca (*Lepidium meyenii*) is a plant that has been traditionally used to enhance fertility, energy, and endurance. Its mechanism of action is complex and involves multiple pathways. Here is a detailed explanation of how maca works:

1. Hormone Regulation: Maca affects hormone balance by stimulating the hypothalamus and pituitary gland, which regulate the production of hormones such as testosterone, estrogen, and progesterone [26].

2. Neurotransmitter Modulation: Maca influences neurotransmitters like serotonin, dopamine, and GABA, which are involved in mood regulation, appetite, and sleep [27].

3. Antioxidant Activity: Maca's antioxidant properties help protect against oxidative stress and inflammation, which can contribute to chronic diseases [28].

4. Energy Metabolism: Maca increases energy production by enhancing mitochondrial function and ATP synthesis [29].

5. Inflammation Reduction: Maca's anti-inflammatory properties reduce inflammation, which can contribute to chronic diseases [30].

6. Endocrine System Support: Maca supports the endocrine system by stimulating the adrenal glands, pancreas, and thyroid gland [31].

7. Reproductive System Support: Maca enhances fertility by improving sperm quality, increasing libido, and regulating menstrual cycles [32].

8. Bone Health: Maca's mineral content and ability to regulate hormones support bone health [33].

9. Cardiovascular Health: Maca's antioxidant and anti-inflammatory properties help protect against cardiovascular disease [34].

10. Gastrointestinal Health: Maca prebiotic fibers support gut health and immune system function [35].

Introduction to Ginseng:-

For over 20 centuries, ginseng has been a cornerstone of traditional herbal medicine, revered for its adaptogenic properties that promote overall well-being, enhance immune function, boost physical and sexual performance, and support management of chronic conditions like cancer, diabetes, and hypertension. [36]



Figure 5: Ginseng root



Figure 6: Ginseng plant

Ginseng and its extracts exhibit immunomodulatory effects, influencing the immune system's response to promote balance and resilience. [37]

Modern functional foods, such as energy drinks and supplements, often feature ginseng as a key ingredient, leveraging its energizing properties to enhance physical and mental performance. [38]

Additionally, ginseng exhibits antiatherosclerotic and antiplatelet effects, contributing to cardiovascular health by reducing the risk of artery damage and blood clots. [39]

Ginseng preparations hold promise as actoprotectors, warranting further research into their potential to enhance physical and mental work capacity, endurance, and recovery from intense physical activity. [40]

Conclusion:-

"In conclusion, the menstrual cycle is a complex and dynamic process that can be affected by various factors, leading to uncomfortable symptoms during menopause. While ginseng has been traditionally used to alleviate these symptoms, maca herb has emerged as a promising alternative due to its unique characteristics and nutritional profile. The survey on menstrual cycle highlights the need for effective and natural remedies, and the evidence suggests that maca herb can be a valuable treatment option for menopausal symptoms. With its ability to balance hormonal levels, reduce symptoms of anxiety and depression, and improve overall well-being, maca herb offers a natural and holistic approach to managing menopause. Further research is needed to fully explore its potential, but the existing evidence suggests that maca herb is a promising solution for women seeking relief from menopausal symptoms."

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