

Pueraria Mirifica for Menopausal Symptom Relief and Tissue Support

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ABSTRACT

Pueraria mirifica, a member of the Leguminosae family, is an herb indigenous to Thailand and has been researched extensively for its beneficial effects in the treatment of menopausal symptoms. Puerarin, the main isoflavone component of *Pueraria mirifica*, modulates estrogen receptor expression and could be a safe alternative for the treatment of estrogen dependent conditions. Pueraria also contains the phytoestrogen miroestrol, which functions as a selective estrogen receptor modulator by competitively binding to estrogen and blocking excessive estrogen receptor stimulation. Pueraria root extract has no known side effects and no known drug interactions have been reported. Its beneficial effects on alleviating menopausal symptoms include the reduction of bone loss and hot flashes and the improvement of blood lipid profiles, which could lead to protection from cardiovascular disease. Results of clinical trials have suggested that *Pueraria* may be a safe alternative to traditional drugs because of its beneficial effects on bone density, genitourinary function and cardiovascular health without the side effects or risks associated with hormone replacement therapy.

Keywords: *Pueraria*, Phytoestrogen, Selective estrogen receptor modulator, Menopausal symptoms

CLINICAL IMPLICATIONS

Pueraria mirifica is a Leguminosae family herb that thrives in warm moist climates around the world. *Pueraria mirifica* is indigenous to Thailand, where it known by the name Kwao Kruea Khao. It has been the subject of numerous recent clinical investigations for possible benefits to menopausal women.

Pueraria mirifica contains the isoflavones puerarin and daidzein and the related phytoestrogen miroestrol. Miroestrol and deoxymiroestrol, like other phytoestrogens, act as Selective Estrogen Receptor Modulators (SERMs). As such, these compounds selectively bind to estrogen receptors and act as agonists or antagonists depending on the tissue and the physiologic circumstances. For instance, miroestrol competes with estrogen and blocks the excessive stimulation of estrogen receptors often seen with breast or endometrial cancer. On the other hand, these phytoestrogens act as estrogen agonists to support bone density, promote cardiovascular health, and to alleviate menopausal symptoms.¹

Pueraria root extract is typically recommended in the treatment of menopause-related hot flashes, at a dose range of 200 mg containing 150 mcg Miroestrol twice per day. Symptom resolution of hot flashes often occurs within a few weeks of therapy.

Pueraria root extract has no known side effects at commonly prescribed doses. There are no confirmed drug interactions found in any clinical trial or quantitative systematic review.

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PUERARIA SPECIES CONTAIN THE ISOFLAVONE PUERARIN

Pueraria, among other legumes, contains isoflavones known to support bone density² and the vascular system.³ Puerarin, the major isoflavone in *Pueraria*, has been shown to be readily absorbed and quickly eliminated. Accordingly, dosing this herb three or more times daily might be advised, to perpetuate blood levels and maintain constant physiologic support of hormonal functions.⁴ In contrast to phytoestrogens such as genistein and daidzein, which may stimulate estrogen receptors in cells that are already over-expressing estrogen receptors (*e.g.* in estrogen-dependent cancers), puerarin has been shown to decrease estrogen receptor over-expression.⁵ Puerarin may thus be considered a safer option in the treatment of estrogen dependant conditions and estrogen dependent cancers.

PUERARIA ALLEVIATES MENOPAUSAL SYMPTOMS

Pueraria mirifica has been shown to alleviate vasomotor and other menopausal symptoms.⁶ The herb reduces FSH and LH levels in menopausal monkeys suggesting that an estrogen-like effect exerts negative feedback to pituitary gonadotrophin release.⁷ FSH and LH levels returned to pretreatment levels upon cessation of the *Pueraria* supplementation. *Pueraria mirifica* has also been found to decrease serum parathyroid hormone and calcium levels in aged monkeys suggesting reduced bone loss.⁸ Flavones from *Pueraria* roots were found to prevent uterine atrophy and prevent increases in total cholesterol and triglycerides that typically follow rapid declines in system-wide estrogen levels.⁹ This study also showed that *Pueraria* limits the increase in abdominal fat stores that occur in ovariectomized menopause animal models.⁹ A human clinical study demonstrated that *Pueraria lobata*, a close but less potent relative of *Pueraria mirifica*,¹⁰ improves cognitive parameters and attention span compared to placebo¹¹.

PUERARIA MAY SUPPORT GENITOURINARY INTEGRITY

Loss of integrity of the vaginal and uroepithelial mucosal membranes is a common occurrence in and after menopause and can lead to vaginal dryness, dyspareunia, and an increased tendency to bladder infections and urinary incontinence. Since pharmaceutical grade hormones often have tremendous side effects on the entire body including increased risk for breast and endometrial cancer, as well as damaging effects on vasculature,¹² there is an ongoing search for herbal, nutritional, and other alternative medications that maintain urinary and vaginal epithelium. Animal studies have shown *Pueraria mirifica* to have a supportive effect on the urinary and vaginal mucosal tissues in a manner similar to, but less powerful than estradiol.¹³ *Pueraria* has been shown to have beneficial effects on the vaginal mucosa, improving vaginal pH, dryness, and dyspareunia as well as achieving measurable estrogen-like effects on atrophic vaginal epithelia.¹⁴



Pueraria Mirifica

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PUERARIA MAY IMPROVE BLOOD LIPIDS

Menopause negatively impacts lipid metabolism as evidenced by increased occurrence of cardiovascular disease and worsening lipid profiles.^{15,16} Prior to menopause, women display less heart disease compared to men, but postmenopausally there is a marked change and women and men display nearly equal incidence of atherosclerosis and other cardiovascular diseases. Blood pressure, insulin resistance, and lipid profiles quickly alter to equal that seen in the male population.¹⁷ Soy isoflavones and other plants in the legume family have been reported in numerous studies to offer a protective effect on the vasculature and slow the detrimental changes to lipids and metabolism seen post-menopause.^{9,18}

Postmenopausal women given *Pueraria mirifica* for two months had improved lipid profiles compared to a placebo control group. HDL increased 34% while LDL decreased 17% in the group receiving the *Pueraria*.¹⁹ Individual phytoestrogens were examined and miroestrol and coumestrol were both reported to act on both alpha and beta estrogen receptors while daidzein and genistein were more active on beta estrogen receptors. The researchers proposed that *Pueraria* phytosterol constituents enabled gene transcription in a manner that benefited lipid metabolism. Other studies have not been able to demonstrate improved blood lipids with the use of *Pueraria*^{3,11} and further investigations are warranted.

CLINICAL TRIALS SHOW PUERARIA OFFERS HORMONAL SUPPORT WITHOUT OVER-STIMULATING THE BREASTS AND ENDOMETRIAL LINING

Another double-blind, placebo controlled human clinical trial administered several dosage strengths of *Pueraria* versus a placebo medication to postmenopausal women aged 45 to 60 and measured the effects on blood lipids, bone alkaline phosphatase, endometrial thickness, and breast parameters. Liver and renal blood parameters were also assessed to rule out any possible organ toxicity caused by the herb. After 24 weeks the groups receiving the *Pueraria* showed a significant decrease in bone alkaline phosphatase suggesting a reduction in bone resorption and turnover. No measurable changes were seen in the breasts or the endometrium in any group, suggesting that *Pueraria* does not have a proliferating effect on the uterine lining

or breast tissue as do pharmaceutical grade estrogens.²⁰

Another clinical pilot study found that *Pueraria mirifica* at either 50 mg or 100 mg a day for six months reduced perimenopausal symptoms of hot flashes and night sweats. Serum estradiol increased slightly with no detectable changes in FSH or LH levels.²¹ A larger follow up clinical trial compared the effects of *Pueraria mirifica* to conjugated equine estrogen, with and without medroxyprogesterone. There were no significant differences between treatment groups with respect to climacteric symptoms, and all participants reported some relief of vasomotor, urogenital, and psychological symptoms. There were no significant differences in FSH, LH, or serum estradiol levels between the groups, indicating that *Pueraria* was as effective as conventional pharmaceutical therapy.²²

PUERARIA AS A SAFE ALTERNATIVE HORMONE REPLACEMENT THERAPY

Due to its numerous benefits *Pueraria mirifica* is considered a safe alternative to improve bone density, genitourinary epithelium, blood lipids, inflammatory markers, and general menopausal symptoms. *Pueraria* may be considered an effective alternative to pharmaceutical hormone replacement therapy. Furthermore, research is suggesting the safe application of *Pueraria* in cases of hormonal excess, hormone-dependent cancers and genetic over-expression of estrogen receptors (**Fig 1**), lending the plant wide utility in the general population.

DISCLOSURE OF INTERESTS

Dr. Saunders reports personal fees related to employment or seeing patients from CCNM, the Dundas Naturopathic Centre, and from Beaumont Health Systems, Troy Hospital, MI, outside the submitted work. Dr. Winston reports personal fees from Herbalist & Alchemist, Inc, outside the submitted work. Dr. Stansbury has nothing to disclose.

REVIEW ESSAY

Many nutrients and herbs that have not been the subject of randomized controlled studies are used regularly by clinicians. They have also been used traditionally for hundreds, sometimes thousands of years. Review Essays contain the opinions of professionals and experts in the fields of nutritional

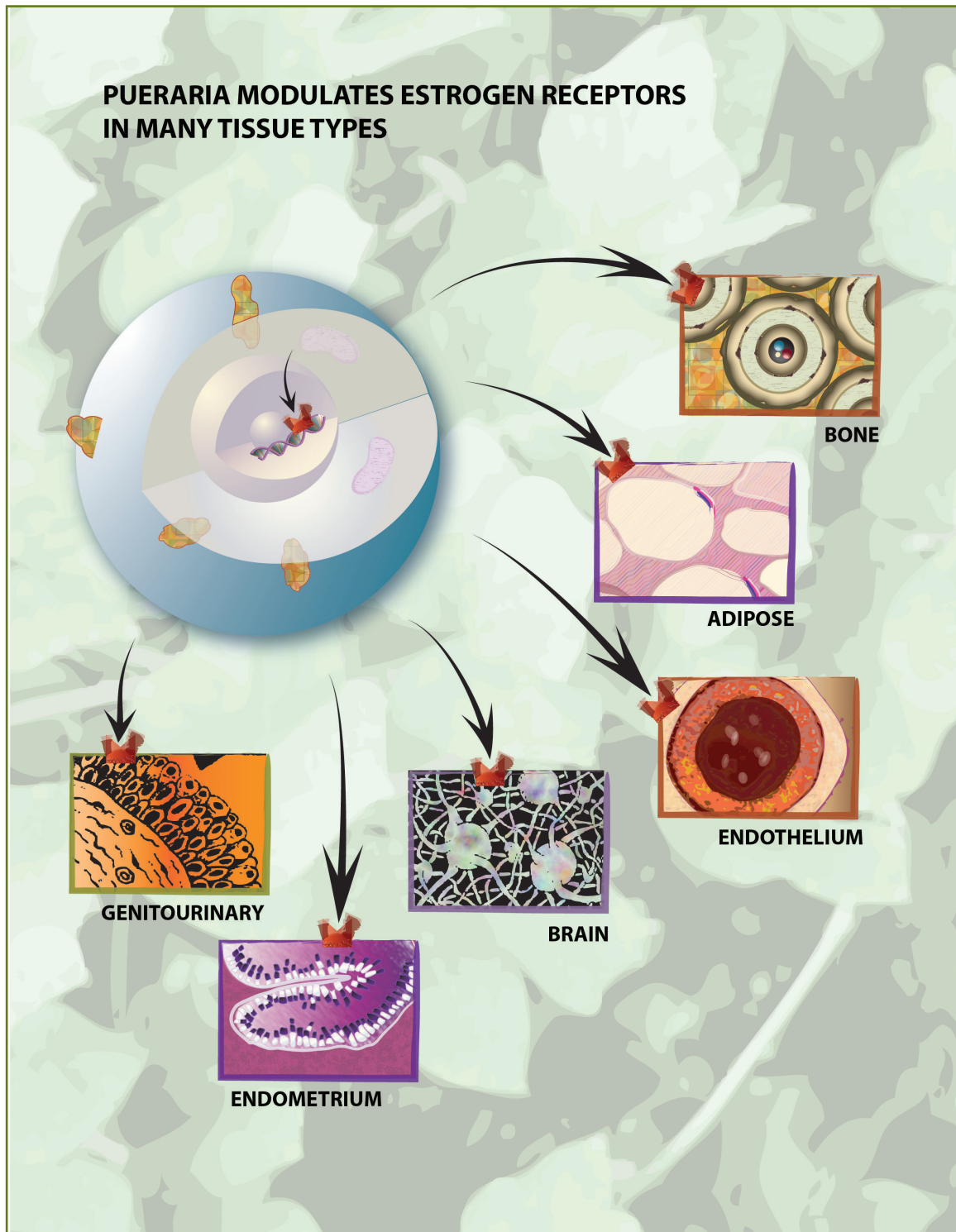


Figure 1

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and botanical medicine on how to most effectively use herbs and nutrients in clinical practice. The dosages recommended are based on clinical experience. Side effects that are described in “Unsubstan-

tiated Theoretical Concerns” have not been seen in clinical practice or clinical studies but are speculative based on, for example, possible mechanisms of action.

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