PURESTEROL®

Table of Contents

The Promise of Puresterol®

Menopause. The onset of this phase of life affects hundreds of millions of women around the world every year. During the five-year period when a woman's body undergoes this important change, the symptoms can be severe enough to disrupt her life and affect the lives of those around her.

For centuries women have sought a cure for the negative consequences of this bodily transformation. Remedies have come and gone, either proving ineffective or too dangerous to be worth the risk.

However, in a far-off corner of Asia in a country called Thailand, women have been finding relief from the symptoms of menopausal change for several hundreds of years. They have found this relief in preparations from the root of a flowering plant that grows in abundance in their region.

That plant is Pueraria mirifica, and its extract is available now in the United States and around the world as Puresterol®.

What was once just a promising plant that Asian women whispered about is now refined and formulated to the highest standards. Administration of Puresterol® is safe and effective. And it is completely natural. With ever increasing numbers of women searching for alternative, organic and holistic remedies and approaches to health, Puresterol® is a perfect fit.

Where was Puresterol® discovered and how does it work? What symptoms does it relieve and what other health benefits can it provide? Those questions and more will be answered in the following pages.

The secret of easing through menopausal change once known only by women in Southeast Asia can now be shared with women around the world. The promise of Puresterol® is a promise about to be fulfilled.

The Kingdom of Thailand

Shaped like the head of a mighty elephant, the Kingdom of Thailand lies at the heart of mainland Southeast Asia. During ancient times, its people called it "The Golden Land," a place of glittering Buddhist pagodas, fertile soil and rich waters. More recently, it was known as Siam – a name that conjured up images of the mystical Far East and the dazzling wonders of the Orient.

Thailand today is often called "The Land of Smiles" because of the gentle, easy-going nature of the 63 million Thai people. The warmth and hospitality they shower on the more than 12 million visitors to their kingdom each year is legendary. Thailand is more, however, than just smiles. It is also known for:

- Thai cuisine, with its unique and flavorful blends of hot and sweet spices that have made it popular around the world.
- White sandy beaches, which draw millions of visitors to its tropical island paradises such as Phuket and Samui.
- Elephants, which roam the countryside and even the streets of the capital Bangkok.
- Jasmine Fragrant Rice widely regarded as the best rice in the world.
- Tiger Woods, the golfing superstar whose mother is Thai; and Paradorn Srichapan, the world-class tennis player.
- Orchids and a bounty of other botanicals from Thailand's lush tropical rain forests.

Thailand is also known for its vibrant economy. A rapidly industrializing nation, it had the fastest growing economy in the world from 1985-95. Having survived the Asian Financial Crisis of 1997, its economy is stable, solid and growing at a steady pace once again.

Exports are the engine that drives the Thai economy. Among the country's leading items it ships overseas are computers and parts, integrated circuits, electronic equipment, plastics, textiles and gems and jewelry. Regionally, Thailand is a leading manufacturer and shipper of automobiles and parts. Anyone who has ever been stuck in a Bangkok traffic jam can testify to the people's love affair with cars, and the country has been called "The Detroit of Southeast Asia."

Despite the growth of factories and industrial estates turning out high-technology products, Thailand remains primarily a nation of farmers and

fishermen. More than half of all Thais cull a living from the soil or the sea. Coastal waters teeming with marine life provide bountiful catches for Thailand's aggressive fishing fleets. A drive beyond Bangkok will take you through a landscape lined with verdant fields of rice, sugar cane and corn.

Deeper inland, dense and unspoiled rain forests are still rich sources of food and natural cures for local folk, including the colorful hill tribes who roam the country's border regions. In towns and villages modern medicine is often mixed with traditional healing using powders, salves and other prescriptives derived from the thousands of herbs, plants and flowers found in Thailand's forests. Recently, some have realized the potential these natural curatives have for wider markets, and they have become a growing element in Thailand's trade.

Thailand's trading partners are diverse. Nearly a quarter of all Thai exports are destined for the United States, while China and Japan are also major buyers of Thai goods. The European Union and other Southeast Asian nations are significant importers of all that Thailand produces. The last decade has seen the opening of new trading relationships with countries in South America and Africa.

This wide array of friendly trading partners is characteristic of Thailand's open approach to the world. Thai means "free", and the Thai people originally migrated down from southern China more than a millennium ago. As early as the 1,400s, adventurers and foreign emissaries reported being welcomed in the ancient capital of Ayuthaya.

During the 1800s, as neighboring Burma, Laos, Cambodia, Viet Nam and Malaysia all fell under British or French colonial rule, Thailand remained a free and independent country. This was largely due to the deft diplomatic maneuverings of King Mongkut and his successor King Chulalongkorn. Both men had a keen interest in the advancements taking place in Europe and America and strove to incorporate new ideas, where appropriate, as they guided the development of their country.

In 1932, the monarchy shifted from absolute to constitutional, and in 1946 Siam changed its name to Thailand. The next half century or so would be a turbulent time for the region, as revolutions and communist insurgencies swept across most of Thailand's neighbors. Through it all, Thailand remained free, and offered shelter to hundreds of thousands of refugees from war-torn lands. It established alliances and friendly relations with both the United States and China, while remaining committed to free and open markets and economic development. In fact, Thai companies were some of the first to gain a foothold in China, as that Asian giant began opening its markets.

Today's Thailand offers something for everyone. In the capital, Bangkok, and other major cities, a new youth culture has made the country one of the hippest stops for travelers in Asia. The Thai passion for commerce draws the world's leading companies to set up shop in the kingdom. Yet, out in the villages and the farmlands, the classic Thai warmth and hospitality remains a way of life. Thailand is truly a place where the cutting edge and tradition blend as seamlessly as the spices in a tasty bowl of curry.

A Remarkable Monarch

In June of 2006, kings and queens, emperors and empresses, princes and princesses from 25 royal families around the world journeyed to Thailand. They came to celebrate the 60th anniversary of the coronation of King Bhumibol Adulyadej, (Boom – ee – bone Ah – doon – ya – det) and to honor the man who is now the longest reigning monarch in the world. "You are our most respected colleague," said the Sultan of Brunei. "You inspire us all."

King Bhumibol is more than loved and respected by Thais, and not just because of his longevity. Thais revere their king because he has truly made a difference in their lives. A constitutional monarch, he is not merely a figurehead. He has devoted his life to uplifting the poor among his subjects, and more than once, using only his moral authority, he has intervened during political crises to pull his nation back from the brink of disaster.

He is the only King ever born in the United States, entering this world on December 5, 1927 in Cambridge, Massachusetts where his parents were studying medicine. Educated in Europe, he was elevated to King in 1946 after the untimely death of his elder brother, King Ananda.

King Bhumibol is a talented photographer, musician, painter and sportsman. But it is his 2,000 royal projects aimed at improving the lives

of farmers and the poor that have earned him the lasting devotion of his people. Perhaps more than any other people in the world today, Thais are sincere when they shout “Long Live the King.”

Thai Traditional Medicine

It might surprise you to learn that Thailand is a nation with an advanced public health care system. In fact, the quality and affordability of health care available in Thailand has a worldwide reputation, and has even been highlighted on “60 Minutes” the famed US television newsmagazine. Patients from Europe, America and the Middle East fly to Bangkok for fast, reliable and affordable treatment offered by a number of hospitals with international accreditation.

Nonetheless, many Thais rely solely on traditional medicine, or combine it with modern health care. Despite the advances of modern science, Thai Traditional Medicine has not lost its appeal to many in Thailand’s villages, towns and even its cosmopolitan cities. With increasing numbers of people in developed countries also searching for alternative and holistic approaches to health and well being, Thai Traditional Medicine is just beginning to earn an international reputation as well.

Thai Traditional Medicine has its roots in both Ayurvedic medicine, the ancient and natural healing arts developed in India, and Traditional Chinese Medicine. That makes perfect sense. As the crossroads of Southeast Asia, situated midway between these two Asian giants, Thailand has incorporated Chinese and Indian influences in its culture, cuisine and even to some extent its religion. In each instance, however, what has emerged from this blend of influences is uniquely Thai. The same holds true for Thai Traditional Medicine.

Thai Traditional Medicine is as old as the Thai people. The first written accounts of Thai medicinal formulas, however, date to 1182, when the kingdom was known as Sukhothai. Recorded texts from centuries past are rare, though, as practices and formulas were usually handed down by word of mouth.

As the country took its first steps towards Westernization during the latter half of the 19th century, Thai Traditional Medicine was actually outlawed. In the drive to adopt modern technologies, indigenous knowledge was devalued. Traditional healers were regarded as quacks or charlatans and could only practice clandestinely for fear of arrest.

A century later, that began to change. Traditional Medicine was included in the first National Economic Development Plan in 1961. But a real revival of Thai Traditional Medicine and the use of medicinal plants started in 1978. A decade after that, the Ministry of Public Health established the Thai Traditional Medicine and Pharmacy Coordinating Center to begin promoting and regulating the long-forgotten field.

In 1993, the Institute for Thai Traditional Medicine was founded and is now housed on the grounds of the Ministry of Public Health just north of Bangkok. Three years later the government established the Thai Traditional Medicine Development Foundation, which works closely with the institute to research and develop new formulas from indigenous plants.

Several leading universities have also begun offering programs in Thai Traditional Medicine, including Mahidol University, the country's leading medical school, and Thammasat University, which has been described as the Yale University of Thailand.

By 2003, 83.3% of regional general hospitals and 67.8% of community hospitals had at least one practitioner of traditional medicine. There are nearly 15,000 practitioners in Thailand today. In addition, the country has about 600 traditional drug manufacturers. Most of them are small-scale businesses.

So what exactly is Thai Traditional Medicine? Simply put, it is a holistic approach to health based principally on the use of plants. This includes herbal medicines, and to date at least 3,820 traditional medicine formulas have been recorded by the Ministry of Public Health. Plants are also used for herbal saunas, herbal steam baths and hot compresses. Thai Traditional Medicine also encompasses meditation, dietary control, traditional massage, acupuncture and reflexology.

This all might sound like something out of a relaxing day at a spa, and that's not far off base. Many of Thailand's best known spas use traditional herbal formulas and restorative practices to cure, correct, rejuvenate and reinvigorate those who spend time there. Thailand's spas have taken off during the last decade, earning sterling appraisals from both the travel and medical communities, as well-heeled jet-setters regularly fly in to take advantage of the unique pampering and effective healing treatments delivered in luxurious surroundings.

Thai Traditional Medicine views illness as a sign of imbalances in the body and mind and seeks to restore a person's physical, mental and spiritual harmony. "It goes beyond a person's physical discomfort to embrace that person's relationships with others and the environment, which can cause illness. Thai medicine tackles the root of the illness, not only its symptoms," says Phra Uppakara Pattanakij, a Buddhist abbot whose work as a traditional medical practitioner won him Thailand's 1993 Cultural Outstanding Person Award in the field of local wisdom (herbal treatment).

Traditional medicine, therefore, doesn't separate itself from religious beliefs, human relationships and the environment. "All these factors affect one's health. A physician's understanding must therefore go beyond the patient's symptoms in order to be effective," he added.

The late Dr. Pennapha Subcharoen, Director of the Institute of Thai Traditional Medicine said that heath means having a healthy body, mind, society and environment.

In traditional Thai theories of health, people are associated with one of four elements: earth, water, wind and fire. While people may have aspects of themselves that correspond to several elements, the majority of each person's characteristics will match one of the elements, making it that person's dominant element.

Traditional healers determine a person's dominant element by knowing their date of birth and observing their appearance and traits.

Depending upon whether a person's dominant element is earth, water, wind or fire, traditional healers will prescribe different groups of indigenous vegetables and fruits, sweets, drinks and prepared dishes to either keep or restore the balance in their system. For instance, someone whose dominant element is earth will be advised to drink lots of orange juice, while someone whose dominant element is fire should drink watermelon juice.

Beyond diet, meditation to develop mental strength, concentration and calmness is also important. Even modern physicians have come to acknowledge the close link between mind and body. Thai practitioners recognized it all along.

The core of any society is family, and so Thai healers advocate healthy, caring and respectful family relationships, as the cornerstone of a calm and healthy mind and spirit and as the building blocks of a healthy society.

Lastly, there is the environment. In this day and age, with the threat of global warming, everyone is aware of the importance of environment. Thai practitioners urge everyone to go "green" and grow more medicinal plants to serve as a "medicine bank" for the world.

Introducing Thai Botanicals

Tradition is important in Thailand. Even as the nation strives to develop, those guiding and shaping its modernization haven't lost touch with their roots. Nowhere is that more evident than at the Ministry of Public Health. While the public health officials continue to build an advanced national health care system employing the latest technologies, they are also rediscovering their roots – literally.

The lush teeming rain forests that still cover areas of Thailand are a storehouse of botanicals that have been used for medicinal purposes for centuries. The properties of other plants native to Thailand and their potential to cure illness and disease are just beginning to be explored.

The Ministry of Public Health has taken a leading role in protecting and developing this valuable national resource. The Ministry funds research and development of medicinal uses of Thai botanicals through its Department of Medicine, the Institute of Thai Traditional Medicine, the Department for Development of Thai Traditional and Alternative Medicine, and the Thai Traditional Medicine Development Foundation. With so many skilled doctors and researchers working in this field, new uses and benefits of Thai botanicals are bound to be discovered.

Thailand already offers a bounty of botanicals. Millions of people around the world are consuming them regularly in medicinal form or as supplements to improve their health. Among the most popular are Zingiber Cassumunar, Andrographis Paniculata, Curcuma Longa, Clinacanthus nutans and Pueraria Mirifica.

- Zingiber Cassumunar – known locally as Plai, this herb is used as an effective topical anti-inflammatory. A member of the ginger family, it is the main ingredient in the hot herbal compresses called "Luk Pra Kob" that are often used in spas to relieve muscle aches and pains and reduce swelling and inflammation. Plai has also demonstrated anti-microbial and anti-oxidant properties, and has been developed into creams and gels to treat muscle and joint aches, pains and sprains. Plai oil is now produced under the trade name Plaitanoid in a collaboration between the Ministry and the private sector, and is used to make massage oils, cosmetics and as an ingredient in various drugs.

- Andrographis Paniculata – An herb that has been clinically proven to help fight colds and flu by stimulating the immune system. It also has anti-inflammatory and anti-pyretic properties, meaning it

reduces fever. It is also used to treat sore throats and non-infectious diarrhea. This herb has been subjected to a battery of clinical trials and tests, which have documented its efficacy and safety as an ingredient in cold and flu remedies. It is an effective alternative to Echinacea, to which some people are allergic.

- Curcuma Longa – Commonly known as Turmeric, Thais have used this herb for centuries, as a spice, herbal medicine and skin care treatment. Turmeric is grown in many parts of the world, but the variety natural to Thailand has been shown to possess higher levels of active ingredients such as curcuminoids and volatile oils than varieties grown in other locales. Turmeric is often used in Thailand to treat flatulent dyspepsia. The curcuminoids, and turmeric's powerful anti-oxidant qualities, have been tested on animals and displayed some ability to reduce the incidence and severity of some cancers. At this point in time, however, its anti-carcinogenic effects on humans have not been proven.

- Clinacanthus Nutans – This herb has been developed into a cream to treat herpes infections. Clinical research has shown that its extracts are as effective against the Herpes Simplex and Herpes Zoster viruses as acyclovir – the drug most often prescribed. In addition, Clinacanthus Nutans doesn't produce the burning sensation that some patients complain of when using acyclovir. Thai hospitals often prescribe it. Nutans also has proven anti-inflammatory properties, and so it has been manufactured into topical creams and lotions, as a natural product that relieves minor skin inflammation and insect bites.

- Pueraria Mirifica – The most promising of all Thai botanicals, Pueraria Mirifica, or "Kwao Kreu", has been used for centuries for a variety of medicinal and cosmetic purposes by Thais. It is now being introduced around the world as a proven phytoestrogen capable of providing relief to menopausal women.

With this impressive lineup of botanicals, as its cornerstone, the Ministry of Public Health is applying its resources to spread knowledge and awareness of medicines and supplements made from Thai botanicals while also funding research into new uses for these national treasures.

Among the activities the Ministry has undertaken in this area are:

- Providing grants and other funding for research projects on medicinal plants.

- Organizing annual meetings and seminars of practitioners of Thai Traditional Medicine and Medicinal Plants in order to share the latest knowledge and developments.
- Establishing a Training Center for Thai Traditional Medicine that includes courses on traditional pharmaceuticals and medicine.
- Releasing publications to disseminate knowledge on Thai botanicals and medicines.
- Establishing the Center for Herbal Raw Materials to promote the cultivation and sale of botanicals for the production of herbal medicines.
- Founded Thai Health Promotion Centers to provide traditional medicine services to the public.

Aside from its role in research, development and disseminating knowledge, the Ministry also plays a role regulating the growing Thai natural medicinal and cosmetics products industries. During the past decade, hundreds of small and medium-size companies have been founded that are manufacturing a wide range of remedies, cures and beauty aids with Thai botanicals as their basic ingredients.

These products have been subjected to rigorous testing and research to verify their efficacy, reliability and safety. The result has been hundreds of cosmetics, food supplements, herbal medicines, health foods and drinks coming to market. Acutely aware of consumer concerns and global standards, the Ministry employs high standards for testing any herbal product before approving it for sale to the public. The Thai natural product industry also has its own set of standardized good practices that its members follow to ensure consistency when it comes to quality and efficacy.

The next step is to go global. With these vast natural resources at the country's disposal, and the strict standards applied by the Ministry in approving natural products as safe and effective, natural medicines and cosmetics made from Thai botanicals are about to begin winning converts among consumers around the world.

Genus Pueraria

Pueraria is one of the most versatile and promising of all the plants found in Asia. Pueraria is more, however, than just one plant. It is a genus, or class, of plants with more than 100 varieties, 13 of which are native to Thailand. Some varieties of Pueraria have medicinal properties or are used in food, while others are poisonous. Some are fodder, while others are weeds. Certain species of Pueraria are relatively rare and found in just one or two provinces of the country. Others are common and grow wild all over Asia. And since the days when Westerners began traveling through Asia and bringing back their discoveries, Pueraria has been growing in abundance in many areas of North and South America and Australia.

Pueraria was first studied, named and classified by Western scientists in 1825. The famed Swiss botanist Augustin Pyramus de Candolle was the first to study the genus in detail, naming it after a fellow Swiss botanist and friend, M.N. Puerari, who taught at the University of Copenhagen in Denmark. De Condolle identified only two species of Pueraria, but it didn't take long for other botanists to begin studying the plant and adding varieties to the genus. A major study of Pueraria was published by English botanist George Bentham in 1867. It would take more than a century before the next was published, by L.J.G. Ven Der Maesen of the University of Illinois, in 1985.

Many Americans don't need a scientific study to recognize Pueraria. They know it as Kudzu, a woody climbing vine with beautiful deep purple and fragrant flowers. It has sometimes been referred to as "the plant that ate the South" because of its rapid and explosive growth across the southeastern United States. Originally imported from Japan, Kudzu made its American debut at the Philadelphia Centennial Exhibition in 1876 where it was displayed as a forage crop and ornamental plant. The name Kudzu comes from an area in Japan where the plant was used extensively for medicinal and other purposes. Its true name is *Pueraria Lobata*, and it is one of about 20 species of Pueraria in the pea family known as *Fabaceae*.

The spread of Kudzu truly took off in the 1930s when the United States government encouraged its use to prevent soil erosion. While Kudzu tends to climb upwards along any tree trunk in its path, reaching heights of nearly 100 feet, it also fans out along level ground, its woody vines weaving through other vegetation and soil with an almost meshy net-like effect. That characteristic prompted the idea of using it to prevent

erosion. It was an idea, however, that backfired. Kudzu spread so quickly that it was out of control, covering roads, bridges, power lines and mixing in and damaging other crops. Regarded as a pest weed, the government began discouraging its use in 1953, but by then it was growing wild over most of the south. In all, each year Kudzu overruns or infests nearly 18,000 square miles in the U.S. and costs nearly $500 million in clean up, control and crop damage.

But Kudzu isn't all bad. In fact, it has many positive uses. In Japan, where it has been in use for over 1,300 years, its roots are ground into a fine powder, which is sometimes called Japanese arrowroot, used in traditional Japanese pastries, confectionaries and herbal medicines. When heated in water it adds stickiness to foods. It was so valued in centuries past that it was sometimes collected as tax. Known as "ge gen" in Traditional Chinese Medicine, it is considered one of 50 essential herbs and used to treat tinnitus (ringing in the ears) and vertigo (loss of balance and dizziness).

Even American Southerners have found positive uses for kudzu, making soaps, lotions and jellies out of it, aside from using it as animal feed.

Kudzu has even more value as a medicinal agent. It contains several useful isoflavones, an organic compound related to flavonoids. Most people have heard of flavonoids because they are present in Green Tea and are known for their antioxidant properties. Kudzu contains at least four important isoflavones: daidzein, which is an anti-inflammatory and antimicrobial agent; daidzin, which is an anticarcinogen; genistein, which works against lukemia; and puerarin.

Scientists have also documented other effects of Kudzu, such as reducing the craving for alcohol, reducing the symptoms of hangovers, and relieving migraine headaches. They have yet to figure out what compounds within Kudzu bring these benefits and how.

Other varieties of the genus Pueraria are less well known in the United States. Pueraria Tuberosa, which is native to northern India, Pakistan and Nepal, is used in herbal medicines to treat fevers, rheumatism and reduce swelling. Its roots are also eaten. Others species of Puereria, with names such as Pueraria Bella Prain, Pureraria stricta Kurz and more, also have medicinal and culinary uses and are found in areas of Burma, Thailand, the Yunnan province of China and Viet Nam. From weed to wonder cure, Pueraria is a plant with a cornucopia of uses and capabilities, some of which are just being discovered, and others of which are still unknown.

Pueraria Mirifica – A History

Of all the varieties of Pueraria, *mirifica* is the one that has inspired the most claims and holds the most promise. To the people of Southeast Asia, where this species of Pueraria naturally grows, *mirifica* (Latin for miracle maker) is nothing short of miraculous. Local people believe P. *mirifica* is the cure for a wide range of ailments and conditions all relating to age and vitality. While modern scientists are just beginning to examine and investigate the potentials of P. *mirifica*, its reputation has long been rooted in local folklore, customs and culture.

The wonders of Pueraria *mirifica* have been hailed for nearly a millennium. The first references to this amazing plant were found in Buddhist scriptures inscribed on palm leaves in the ancient capital of Burma. In those days it was called Pookham. Now it is known as Bagan.

Bagan is one of the historical and archaeological treasures of the world, on a par with Angkor Wat in nearby Cambodia. Located on the banks of the Irrawaddy River not far from the storied city of Mandalay, the plains of Bagan are dappled with the ruins of more than 900 Buddhist temples and pagodas. The Kingdom of Bagan's golden age began during the 11th century. It ended when the Mongol warrior Kublai Khan invaded and overran the city near the close of the 13th century. During those 200-plus years Bagan was a major center of religion, the arts, science and scholarship in Asia.

The scholars of Bagan were well aware of Pueraria *mirifica*. The species is native only to Thailand and extends into parts of Burma. It's not surprising then that the first modern documentation of Pueraria *mirifica* emerged from Thailand. The earliest literature in modern Thai was recorded in 1931 by Luang Anusarn Soondhorn, a Governor of Northern Chiang Mai province who translated Buddhist scriptures from Bagan, and palm leaf books in the ancient Lanna language of Northern Thailand, that detailed Pueraria *mirifica's* properties as the starting point for this research. His study revealed that the physicians, healers and people of Bagan regarded it as a miracle herb, extolling its many benefits and devising myriad ways to use it in medicine and food. Luang Anusarn's translation of the scriptures reads as follows:

> To take the tuberous root of Pueraria with big leaves, pound and blend with cow's milk. The benefits of this medicine is to support memory, talk big, and be able to remember three books of the astrology, make the skin smooth like a six year old kid, live more than 1,000 years and parasite diseases are not able to be of trouble.

Blend with rice milk by keeping the rice milk until sour, the benefit is to support softening skin, as the skin of the angel.

Blend with butter cream or honey, the benefit is to support long life, memory and ability to remember three books and the ability for entertaining a thousand customers.

Blend with yogurt, the benefits are to support long life, dark hair, strong teeth and anti skin wrinkles.

Blend with Embolic myrobalan or Beleric myrobalan or Chebulic myrobalan, to improve the eyes clouded over [cataracts] or sightlessness.

Bleach with buffalo milk, apply to the hair for support as a hair tonic, the gray hair will become dark, use with sesame oil for the benefits of darkening hair, and support of hair growth, smoothening skin, every type of parasite disease is not able to be of trouble.

Bleach with milk dropped to the eyes for people who had eye problems. The sightless will become sighted usually in six months. For people who had cataracts, take this medicine two times in the morning and evening and take a shower three times daily.

Taking this medicine, in 3-4 days one will feel feverish, become painful at the waist and in every joint. That feeling will be gone by taking a cold shower and don't stop taking.

Blend with cow's milk or goat's milk by boiling a bottle of the milk and blending in Pueraria powder and make a tablet the size of a monkey apple and dry it, taken once a day before bed.

Take with buffalo's milk by boiling the milk and then blending in the Pueraria powder to make it as the tablet the size of a wild licorice seed or paper seed.

The people of Thailand had also been using Pueraria *mirifica* for centuries in foods and as part of traditional medicine, prompting Luang Anusarn to begin his investigation into its potentials. He reported that women in their seventies and eighties began menstruating again after taking medicines made from Pueraria *mirifica* roots. Aging men also showed renewed vigor and vitality. He cautioned, however, that finding the correct variety of Pueraria that contains the active ingredients in sufficient quantities to bring about these results was **very difficult**.

One year after Luang Anusarn released his findings, Phaya Vinij, a nobleman who kept traditional medical practitioners in his employ, also reported that Pueraria *mirifica* enhances vitality. In 1938, Dr. Dhara Sukhawachana wrote a paper claiming P. *mirifica* has estrogenic effects.

In 1952, Pueraria caught the attention of Western botanists and scientists in Thailand. The botanist A. Shaw, in collaboration with Suvatabhandu, named the species P. *mirifica*. Locals had previously called it "White Pueraria". And in 1958, Dr. G.S. Pope of the National Institute for Research of Dairy in Redding, England, discovered an important chemical constituent in Pueraria *mirifica* – Miroestrol. Forty years later, new studies identified "Deoxymiroestrol" and "Peumiricarpene", as other chemicals contained in P. *mirifica,* that produce estrogen-like effects. The significance of these chemicals and the science of Pueraria *mirifica* will be explained in the following chapter.

Meanwhile, interest in traditional medicine was growing just as Thailand's economy began to surge rapidly during the 1990s. A number of local companies sprang up to capitalize on P. *mirifica's* potential uses. There are two basic varieties of mirifica – red and white – and Thais call them "Kwao Kreu Daeng and Kwao Kreu Kao." But the same variety of P. *mirifica* grown in different locations in Thailand contains different levels of the important chemicals that provide its benefits. Furthermore, not all the companies that hopped on the Pueraria *mirifica* bandwagon were using the proper species or the most effective processes to draw out these chemicals for use in their products. The result was a range of creams, lotions and pills hitting the market that didn't perform as advertised or do what consumers were expecting.

Today, that situation is changing. Many of the companies selling substandard Pueraria *mirifica* products have gone out of business or are falling by the wayside. However, those that have been using sound scientific and production methods are delivering products that consumers are swearing by and watching as their market shares soar.

The new millennium is the dawn of a new era for Pueraria *mirifica*. Reputable companies and government-affiliated organizations, such as the Thai Traditional Medicine Development Foundation, are investing even more in research and development to understand precisely how Pueraria *mirifica* works, discover new uses and applications for it, and improve production processes to extract P. *mirifica's* healing ingredients in their most pure and powerful forms.

With these improvements in research, production and product quality, Pueraria *mirifica* is no longer a local cure. Health, food and drug authorities in Western and developed countries are increasingly approving Pueraria *mirifica* products for sale and distribution to their consumers, allowing them to enjoy a wonder of the East that has been improving the lives and health of Southeast Asians for centuries.

The Science Behind Pueraria Mirifica

What makes this incredible herb work? After all, Pueraria *mirifica* belongs to the same family of legumes that includes soybeans and peas, and while soybeans and peas provide many health benefits, they are hardly wondrous. After decades of research, scientists are just learning exactly what elements contained in the huge bulbs of the Pueraria mirifica plant bestow such rejuvenating effects upon people and, in particular, to women suffering symptoms of perimenopause.

Pueraria *mirifica* contains a bounty of natural chemical compounds that foster good health. Most fall into a category called "phytoestrogens." The prefix "phyto" means plant, and simply put, they are estrogen-like substances found in plants. These naturally occurring chemical compounds have structures, which are similar to estrogen found in humans.

Estrogen is a hormone that serves as a chemical messenger in the body. For women, it helps control their menstrual cycle, breast development, maintain healthy bones and a healthy heart. From puberty to menopause, the ovaries produce estrogen. Once menopause sets in, the ovaries no longer make estrogen. Instead, body fat becomes the primary source for estrogen.

The five-year period of bodily transition before full menopause is called "perimenopause." During this period, estrogen levels in the body can fluctuate unpredictably while ultimately declining. These fluctuations cause a variety of uncomfortable symptoms, such as hot flashes, night sweats, vaginal dryness and vaginal thinness. Women may also notice decreased libido, a decrease in arousal and orgasmic response, fatigue, weight gain, joint pains, mood swings, sleep disturbance, and hair loss. It also marks the beginning stages of an increased risk of heart disease and osteoporosis.

Phytoestrogens have been proven to bring some degree of relief for these symptoms. Some work better than others. None work anywhere near as well as one unique and special phytoestrogen found only in Pueraria *mirifica*. That phytoestrogen is called miroestrol.

Miroestrol is extraordinarily similar in structure and function to a type of estrogen found in humans called estriol. There are actually three major types of estrogen found in humans: Estradiol, Estrone and Estriol. Of the three, Estriol, which is produced in high levels during pregnancy, and in small amounts in non-pregnant women, is the weakest. Its weakness, however, is actually its strength. Clinical trials have shown no links

between estriol and cancer, and women who have taken it reported few side effects compared with those who took estrodial or estrone as hormone replacement therapies. This is why estriol has sometimes been referred to as “The Friendly Estrogen.” Estriol can still be found in the United States, but only in specialized compound prescriptions.

However, miroestrol, which functions in the same way and provides the same benefits as estriol, is found in Pueraria *mirifica*. It has been patented under the name Puresterol®, and is now widely available over the counter, as a food supplement sold at a fraction of the cost of Estriol. Puresterol® has also been shown to be completely safe in published Phase I, Phase II and phase III clinical trials.

Technically, this is how Puresterol®, standardized with a set level of miroestrol, works: the body contains many types of cells that possess receptors for estrogen. These receptors allow the body to process the estrogen. Puresterol® latches onto these receptors, which in turn react to Puresterol®, as if it was human estrogen, in particular, estriol. Puresterol® functions as an “adaptogen,” or a SERM (Selective Estrogen Receptor Modulator) a scientific term for an agent which balances hormones and the immune system to keep the body in optimal health.

While this is happening, the body does not produce more estrogen. It doesn’t need to, because the Puresterol® is performing the same function on the cell receptors without the harmful side effects. Puresterol® is a member of a subgroup of phytoestrogens called phytosterols, and an increased intake of phytosterols has been associated with decreased cholesterol and decreased risk of some cancers, most notably breast and ovarian cancer.

Puresterol® is the key compound that sets Pueraria *mirifica* apart from any other plant or herbal remedy. P. *mirifica*, however, is chock full of other phytoestrogens that have also been shown to have beneficial health effects. Among them are Isoflavones and Coumestans.

As with Puresterol®, Isoflavones compete with estrogen for the same cell receptors. Isoflavones are what makes soy such a healthy food. Two of the most beneficial Isoflavones found in soy are also found in Pueraria *mirifica*: genistein and daidzein. In addition, Pueraria *mirifica* has its own unique isoflavones named puerarin and mirificin. Research has shown that consumption of isoflavones may play a role in lowering risk for disease. Some of the diseases isoflavones are believed to fight include heart disease, prostate problems, osteoporosis, viruses, allergies and cancer. Isoflavones are also strong antioxidants.

Another group of phytoestrogens are called coumestans, and Pueraria *mirifica* has several, including coumestrol. Coumestans also have anti-carcinogenic effects, and coumestrol is one of the strongest. P. *mirifica* also contains three unique coumestans called mirificoumestan, mirificoumestan glycol and mirificoumestan hydrate.

All these compounds working together have led scientists to conclude that Pueraria *mirifica* exhibits the highest phytoestrogenic activity of any plant.

Hormonal balance is one key to good health. Even some men are seeking hormone replacement therapies in an effort to find a fountain of youth. By helping to regulate the body's responses to changes in hormone level that result naturally from the aging process, Puresterol® makes people feel younger, healthier and fitter. This may be why many people in Thailand reported that by taking Pueraria *mirifica* they felt renewed energy and vigor, saw improvements in their skin, gray hairs regained their earlier color and problems from cataracts were alleviated. It is why that by 1932 international ethnobiologists labeled Pueraria *mirifica* a "rejuvenating agent."

Puresterol® is safe. The safety of the root bulb of Pueraria *mirifica* has been extensively studied. While hormone replacement therapy is now in disrepute because of its links to cancer, the same is not true for Puresterol®. The reason is that in hormone replacement therapy, estrogen is added to the body after it has naturally stopped producing it. Estrogen aids cell division. Cancerous tumors are cells that are dividing and replicating at a pace that is out of control. As Puresterol® does not induce the body to produce more estrogen after it has stopped doing so naturally, this risk does not exist when someone takes Puresterol®. In fact, because Puresterol® is an adaptogen / SERM, it helps regulate the body's natural metabolism and healthy state, and so in theory should help (and soon to be shown) prevent cancers.

No evidence of toxicity has been found when rats were given 2,200 milligrams per kilogram of body weight orally, which would be the equivalent of giving woman 100 grams of Puresterol® at one time. Rats were also given 10 milligrams and 100 milligrams per kg bodyweight of P. *mirifica* orally every day for 90 days without evidence of any significant adverse effects. Ninety days in a rat is the allometric equivalent of 1.5 human years. These safety studies and others have concluded that an oral safe dosage for humans is in the range of 1 to 2 milligrams per kilogram (per 2.2 to 4.4 lbs) per day, or 50-100 milligrams a day. Interestingly, this is the range that is typically taken traditionally by Thai women.

The Future of Pueraria mirifica

Pueraria *mirifica* has had a sterling reputation for centuries in Southeast Asia, as a natural cure for a variety of ailments including symptoms of perimenopause. Except among a few scientists who study plants, however, it has been virtually unknown in other parts of the world.

All that is about to change.

Pueraria has just been launched in the United States under the brand name Puresterol® and is about to introduced to markets on every continent except Antarctica. Hundreds of millions of women around the world enter menopause and suffer from its discomforts each year. In the United States alone, 45 million women will experience menopause this year. Approximately 15 million of them will have no symptoms, while 30 million will. The symptoms normally last about five years. Of those 30 million women, about half will seek relief from prescription medicines.

That leaves at least 15 million women who are looking for alternative methods to ease their symptoms. With the current and growing popularity of natural cures and products, many will naturally turn to Pueraria mirifica.

They won't be disappointed.

Women in Thailand and neighboring countries have been relying for ages on Pueraria and swearing by its effects. Now that Puresterol® has been allowed to be sold, as a food supplement, by the a number of Food and Drug Administrations, it has passed the most strict and stringent safety tests anywhere in the world. So, it won't be long before women around the world learn about Pueraria and the relief it brings, along with many other health benefits.

Just think about the numbers. China alone, with its population of over a billion, must have hundreds of millions of women experiencing menopause every year. The same is true of India with its billion-plus population. Countries such as Indonesia, with its 200 million people, are also fertile ground to catch on to P. *mirifica.*

And in Asia, most people are already predisposed to trying natural and alternative cures. In fact, in many Asian countries, including China, health care systems are relatively underdeveloped. Countless women are

already relying on small clinics and even local healers for medical treatment and advice.

P. *mirifica* is the perfect bridge between these two worlds.

A natural product with a long history of use in traditional medicine, it is now being extracted and manufactured with the most modern techniques to ensure it is as powerful, effective and safe as possible.

Not all Asian countries can be classified as developing. Japan, Korea and Taiwan, for instance, are modern nations with highly developed health care systems. And yet P. *mirifica* is also being marketed and sold there, and its use among Japanese, Korean and Taiwanese women is rapidly increasing.

Beyond Asia, P. *mirifica* will also be available in Europe, South America and Africa. Europe in particular is a promising market for P. *mirifica*, as its citizens are increasingly looking for alternatives to the medical systems that exist in several countries, are gaining awareness about herbal remedies, and are establishing more extensive distribution networks for alternative treatments.

The search for alternative cures is reflected in the growing number of people taking yoga classes, massage instruction and consuming herbal supplements such as Gingko, Ginseng and St. John's Wort. In fact, many European medical societies recognized and recommended the value of herbal supplements long before their American counterparts.

Countries in Europe, and others such as Japan, are also in the midst of strong demographic shifts in the age of their populations. This has sometimes been referred to as the "graying" effect. Simply put, with the post-World War II "baby boom" behind us, populations in many developed countries are aging. The largest segments of the female population are now in the age range where menopause becomes an issue. These women are in the market for something to help them deal with this change of life.

Everyone is increasingly aware of the potential for serious adverse effects from today's increasing levels of pollution. There are hormone disruptors including Dioxins and PCB's in virtually everyone on earth.

We live in a day of increasing sophistication in science and the exciting new field of molecular biology offers insight and is helping us to understand how we may overcome some pollutants using natural products like Puresterol® to neutralize some of the toxins found in everyone today.

Today, scientists study estrogen receptors and are beginning to understand the adverse effects of some of these pollutants many of which work at the estrogen receptors level, which are found in men and women. These estrogen receptors are present in all humans, male and female. They are known to be present in heavy concentration in many tissues including the uterus and prostate, breast, brain and bone.

Some of the pollutants we find in everyone today function as endocrine disruptors. They have been blamed for aggravating age related hormone problems and also for the premature puberty increasingly seen in children around the world today.

Phytoestrogens are known to work at the estrogen receptor sites. These important compounds are found in many plants, including Black Cohosh, Red Clover, Soy, etc.

Those plants are known to offer some minimal beneficial effects against many of the menopause related problems including bone loss, hot flashes, vaginal dryness, and depression etc.

There is no comparison between those minimal phytoestrogen effects seen with other herbs and the dramatic benefits seen in patients receiving Puresterol®. Pueraria may be the ideal Phytoestrogens source that the world has been seeking with tremendous potential benefits and virtually no known significant risks. Properly prepared P. *mirifica* will help overcome today's epidemic of age related menopausal problems. However, with increasing age and the accumulations of toxic estrogen mimics in everyone, hormone related problems, including bone loss, are affecting men too, so Puresterol® can help men as well.

It is widely recognized today that bone loss affects over 50% of women past the age of 50 in the United States. Men develop bone loss also; it just starts about 10 years later. Understanding the function of estrogen receptors, which are found in prostate, bone and brain, has led men to take 100 mg of Activated Phytoestrogen Complex containing 20 mcg of miroestrol daily.

Pueraria is making its debut at a most opportune time. With more women than ever seeking relief from the symptoms of menopause, there is now an answer to their dilemma. It is an answer that is all at once old and new. An answer literally rooted in traditional medicine and developed to modern medical standards of performance and safety. An answer that takes the pain and discomfort out of aging, and helps to

make the future brighter – a time of life to be enjoyed, appreciated and anticipated.

The answer is Pueraria *mirifica.*

Selected Supporting References

1. Lapanantasin S, Chindewa R, Chaovipoch P and Chongthammakun S. Department of Anatomy, Faculty of science, Mahidol University, Bangkok, Thailand *Neuroprotective effects of Pueraria Mirifica on ischemic-induced neuronal death. International Society of Neurochemistry, Journal of Neurochemistry* 88 (Suppl. 1) 2004.

2. Potee, Alicia. Health Sciences Institute. *An ancient Thai "miracle" herb reveals itself to be a real-life fountain of youth*. *HSI* September 2007, Vol. 12, No. 3.

3. Wattanapitayakul, SK, PhD, Chularojmontri Linda, MS, Srichirat S, PhD. Department of Pharmacology, Faculty of Medicine, Srinakharinwirot University; Inter-Department of Pharmacology, Graduate School, Chulalongkorn University; Department of Pharmacology, Faculty of Veterinary, Chulalongkorn University. *Effects of Pueraria Mirifica on Vascular Function of Ovariectomized Rabbits. J Med Assoc Thai* 2005; 88 (suppl 1): S21-9.

4. Chansakaow S, Ishikawa T, Sekine K. *Isoflavonoids from Pueraria Mirifica and their estrogenic activity. Planta Med 2000; 66:572-5.*

5. 5. Chansakaow S, Ishikawa T, Seki H, Sekine K, Okada M, Chaichantipyuth C. Faculty of Pharmaeceutical Sciences and Chemical Analysis Center, Chiba University, 1-33 Yayoi, Image, Chiba 263-8522, Japan, R & D Division, Nippon Kayaku Co., Otd., 3-31-12 Shimo, Kita, Tokyo 115-8588, Japan and Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn, University, Bangkok 10330, Thailand. *Identification of deoxymiroestrol as the actual rejuvenating principle of "Kwao Keur", Pueraria Mirifica. The known miroestrol may be an artifact. J Nat Prod* 2000; 63:173-5.

6. Lee, YS, Park JS, Cho SD, Son Jk, Cherdshewasart W, Kang KS. Faculty of Pharmaceutical Sciences and Chemical Analysis Center, Chiba University, 1-33 Yayoi, Inage, Chiba 263-8522 Japan, R & D Division, Nippon Kayaku Co., Ltd., 3-31-12 Shimo, Kita, Tokyo 115-8588, Japan and Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University of Bangkok 10330, Thailand. *Requirement of metabolic activation for estrogenic activity of Pueraria Mirifica. J Vet Sci 2002; 3:273-7.*

7. *Chirawatkul S, Patanasri K, Koochaiyasit C. Perceptions about menopause and health practices among women in northeast Thailand. Nursing and Health Sciences (2002) 4:113-121.*

8. Trisomboon, H, Malaivijitnond S, Suzuki J, Hamada Y, Watanabe G, Taya K. *Long-term treatment effects of Pueraria Mirifica phytoestrogens on parathyroid hormone and calcium levels in aged menopausal Cynomolgus monkeys. J Reprod Develop 50* (6):639-645, 2004.

9. Jeon GC, Park MS, Yoon DY, Shin CH, Sin HS, Um SJ. Department of Bioscience and Biotechnology/Institute of Bioscience, Sejong University, Seoul 143-747 Korea; Chebigen Inc., 305-B, Chungmugwan Sejong University, Seoul 143-747 Korea; Laboratory of Cell Biology Korea Research Institute of Bioscience and Biotechnology Daejeon 305-333 Korea; Seohae Environment Science Institute, Chonbuk National University Total Research Complex Jeonbuk 865-854 Korea. *Anti-tumor Activity of Spinasterol Isolated from Pueraria roots. Exp Mol Med.* 2005 Apr 30; 37 (2):111-20.

10. Ansquer Y, Legrand A, Bringuier AF, Vadrot N, Lardeux B, Mandelbrot L, Feldmann G. *Progesterone induces BRCA1 mRNA decrease, cell cycle alterations and apoptosis in theMCF7 breast cancer cell line*. *Anticancer Res.* 2005 (1A):243-8

11. Pozo-Guisado E, Merino JM, Mulero-Navarro S, Lorenzo-Benayas MJ, Centeno F, Alvarez-Barrientos A, Salguero PM. *Resveratrol-induced apoptosis in MCF-7 human breast cancer cells involves a caspase-independent mechanism with down regulation of Bci-2 and NF-kappaB. Int J Cancer* 2005 May 20; 115(1):74-84.

12. Chandeying V, MD, Lamlertkittikul S, MD. Department of Obstetrics and Gynecology, Faculty of Medicine Prince of Songkla University, Hat Yai, Songkhla; Department of Obstetrics and Gynecology, Hat Yai Regional Hospital, Hat Yai Songkhla. Challenges in the Conduct of Thai Herbal Scientific Study: *Efficacy and Safety of Phytoestrogen,Pueraria Mirifica (Kwao Keur Kao), Phase I, in the Alleviation of Climacteric Symptoms in Perimenopausal Women, J Med Assoc Thai 2007; 90, 7: 1274-80.*

13. Manonai J, MD, Chittacharoen A, MD, Theppisai U, MD, and Teppisai H, MD. Department of Obstetrics and Gynecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. *Effect of Pueraria Mirifica on Vaginal Health, Menopause* Vol. 14, No. 5, 2007.

14. Osborne DJ and Hallaway Mary. Agricultural Research Council Unit of Experimental Agronomy, Department of Agriculture and Department of Botany, Oxford. *Miroestrol, A Plant Oestrogen, Shows No Effects On Protein Metabolism in Leaves.*

15. D'Amelio Frank S, Sr., and Mirhom Youssef W, Dr. *Pueraria Mirifica "The Miracle Root", Cosmeceuticals No*, Vol. 1, 11 (2004).

16. Cain, James C., Dr. National Research Development Corporation, London, W.I *Miroestrol:An Oestrogen From The Plant Pueraria Mirifica. Nature* Vol. 168, Dec 3, 1960.

17. Urasopon N, Hamada Y, Asaoka K, Cherdshewasart W, Malaivijitnond. Biological Science Ph.D Program, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand; Primate Research Institute, Kyoto University, Inuyama, Aichi 484-8506, Japan; Primate Research Unit, Department of Biology, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand. *Pueraria Mirifica, a phytoestrogen-rich herb, prevents bone loss in orchidectomized rats. Maturitas 56* (2007) 322-331.

18. Anthony C. Dweck FLS FRSC FRSH, Dweck Data, 8 Merrifield Road, Ford, Salisbury, Wiltshire SP4 6DF, UK. *The role of natural ingredients in anti-ageing of the skin, Page 4. Australian Society of Cosmetic Chemists, Annual Congress, Hamilton Island 2003.*

19. Dechapunya C, Watchareewan T, Tapaneeyaphan P, Poonyachoti S. Department of Physiology, Faculty of Medicine, Srinakharinwirot University, Sukhumvit 23, Wattana, Bangkok 10110 Thailand; Department of Physiology, Faculty of Veterinary Medicine, Chulalongkorn University, Patumwan. Bangkok 10300 Thailand. *Possible Effects of Pueraria Merifica on growth of Primary Culture of Porcine Endometrial Cells and Human Endometrial Cancer Cells. Abstract.*

20. *Lemon HM. Pathophysiological Considerations in the Treatment of Menopausal Patients with Oestrogens; The Role of Oestriol in the Prevention of MammaryCarcinoma. Review. Acta Endocrinol Suppl (Copenh) 1980;233:17-27.*

21. *Schiff I, Tulchinsky D, Ryan KJ, Kadner S, Levitz M. Plasma Estriol and its Conjugates Following Oral and Vaginal Administration of Estriol to Post-Menopausal Women:Correlations with Gonadotropin Levels. Am J Obstet Gynecol 1980 Dec 15;138(8):1137-41*.

22. Punnonen R, Vaajalahti P, Teisala K. Department of Obstetrics and Gynaecology, University Central Hospital, Tempere, Finland. *Local Oestriol Treatment Improves the Structure of Elastic Fibers in the Skin of Post-Menopausal Women.* Clinical Trial. *Ann Chir Gynaecol Suppl* 1987;202:39-41.

23. Tercan M, Cokkeser Y, Ozyazgan I, Bekerecioglu M, Sari I. Department of Plastic and Reconstructive Surgery, Gaziantep University, Turkey. Facilitated Tissue Expansion with Topical Estriol. Ann Plast Surg 2001 Jun;46(6):617-20.

24. Kainz C, Gitsch G, Stani J, Breitenecker G, Binder M, Schmidt JB. 2nd Department of Gynecology and Obstetrics, University of Vienna, School of Medicine, Austria. *When Applied to Facial Skin, Does Estrogen Ointment Have Systemic Effects? Arch Gynecol Obstet* 1993;253(2):71-4.

25. Iosif, CS. Department of Obstetrics and Gynecology, University of Lund, Sweden. *Effects of Protracted Administration of Estriol on the Lower Genito Urinary Tract in Post-Menopausal Women. Arch Ghyecol Obstet* 992;251(3):115-20.

26. Lose G, Englev E. Department of Obstetrics and Gynaecology, Glostrup County Hospital, Copenhagen University, Denmark. *Oestradiol-Releasing Vaginal Ring Versus Oestriol Vaginal Pessaries in the Treatment of Bothersome Lower Urinary Tract Symptoms*. Clinical Trial. *BJOG* 2000 Aug;107(8):1029-34.

27. Chlebowski, Rowan T. MD PhD. *Reducing the Risk of Breast Cancer*. *("Tamoxiphen") Harbor-UCLA Research and Education Institute, Torrance California.* Volume 343, Number 3, July 20, 2000.

28. Takahashi K, Okada M, Ozaki T, Kurioka H, Manabe A, Kanasaki H, Miyazaki K. *Safety and Efficacy of Oestriol for Symptoms of Natural or Surgically Induced Menopause*. Clinical Trial. *Hum Reprod* 2000 May; 15(5):1028-36.

29. Schmidt JB, Binder M, Demschik G, Bieglmayer C, Reiner A. Department of Dermatology, University of Vienna Medical School, Austria. *Treatment of Skin Aging with Topical Estrogens*. Clinical Trial. *Int J Dermatol* 1996 Sep;35(9):669-74.

30. Tzingounis VA, Aksu MF, Greenblatt RB. *Estriol in the Management of the Menopause*. *Jama* 1978 Apr 21;239(16):1638-41.

31. Hayashi T, Ito I, Kano H, Endo H, Iguchi A. Department of Geriatrics, Nagoya University School of Medicine, Japan. hayashi@med.nagoya-u.ac.jp. *Estriol (E3) Replacement Improves Endothelial Function and Bone Mineral Density in Very Elderly Women.* Clinical Trial. *J Gerontol A Biol Sci Med Sci* 2000 Apr;55(4):B183-90;Discussion B191-3.

32. Manonai J, Theppisai U. Department of Obstetrics and Gynecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand.

Effect of Oral Estriol on Urogenital Symptoms, Vaginal Cytology, and Plasma Hormone Level in Post-Menopausal Women. *J Med Assoc Thai* 2001 Apr;84(4):539-44.

33. Cherdshewasart W, Kitsamai Y, Malaivijitnond S. *Evaluation of the Estrogenic Activity of the Wild Pueraria Mirifica by Vaginal Cornification Assay*. *Journal of Reproduction and Development*, Vol. 53 (2007), No. 2, April pp.385-393.

34. Longcope C. *Estriol Production and Metabolism in Normal Women*. *J Steroid Biochem* 1984 Apr;20(4B):959-62.

35. Granberg S, Eurenius K, Lindgren R, Wilhelmsson L. Department of Obstetrics and Gynecology, Central Hospital, Elverum, Norway, seth.granberg@telia.com. *The Effects of Oral Estriol on the Endometrium in Post-Menopausal Women.* Clinical Trial. *Maturitas* 2002 Jun 25;42(2):149-56.

36. Yoshimura T, Okamura H. Department of Obstetrics and Gynecology, Kumamoto University School of Medicine, Honjo 1-1-1, 860-8556, Kumamoto Japan. yoshimur@kaiju.medic.kumamoto-u.ac.jp. *Short-Term Oral Estriol Treatment Restores Normal Pre-Menopausal Vaginal Flora to Elderly Women.* *Maturitas* 2001 Sep 28;39(3):253-7.

37. Takahashi K, Manabe A, Okada M, Kurioka H, Kanasaki H, Miyazaki K. Department of Obstetrics and Gynecology, Shimane Medical University, Izumo Japan. taka27@shimane-med.ac.jp. *Efficacy and Safety of Oral Estriol for Managing Post-Menopausal Symptoms.* *Maturitas* 2000 Feb 15;34(2):169-77.

38. Itoi H, Minakami H, Iwasaki R, Sato I. Clinical Trial. Department of Obstetrics and Gynecology, Jichi Medical School, Minamikawachi-machi, 329-04, Tochigi, Japan. *Comparison of the long-term effects of oral estriol with the effects of conjugated estrogen on serum lipid profile in early menopausal women*. Clinical Trial. *Maturitas* 2000 Oct 31;36(3):217-22.

39. Schmidt JB, Binder M, Macheiner W, Kainz C, Gitsch G, Bieglmayer C. Department of Special and Environmental Dermatology, University of Vienna Medical School, Wien Austria. *Treatment of Skin Ageing Symptoms in Peri-Menopausal Females with Estrogen Compounds.* A pilot study. *Maturitas* 1994 Nov;20(1):25-30.

40. Haspels AA, Luisi M, Kicovic PM. *Endocrinological and Clinical Investigations in Post-Menopausal Women Following Administration of Vaginal Cream Containing Oestriol*. *Maturitas* 1981 Dec;3(3-4)L321-7.

41. Kuramoshi Professor, Smitasiri Y Assoc Professor. School of Medicine, Saint Mariane University, Tokyo Japan, School of Science, Mae Fah Luang University, Chiang Rai Thailand. *Preliminary study of Pueraria Mirifica in Japanese. Mid-February and 1st Week August 1999.*

42. Melamed M, Castano E, Notides AC, Sasson S. Department of Pharmacology, School of Pharmacy, Faculty of Medicine, Hebrew University of Jerusalem, Israel. *Molecular and Kinetic Basis for the Mixed Agonist/Antagonist Activity of Estriol. Mol Endocrinol* 1997 Nov;11(12):1868-78.

43. Ritchie M PhD MRSC, Young, R PhD MNIMH. *Protocol for Assessment of Mechanism of Action of Pueraria Mirifica on the Alpha and Beta Receptor of a Selected Breast Cancer Cell Line. Napier University* August 4, 2007. (CONFIDENTIAL)

44. Koloszar S, Kovacs L. Szent-GyorgyiAlbert Orvostudomanyi Egyetem, Szuleszeties Nogyogyaszati Klinika, Szeged. [*Treatment of Climacteric Urogenital Disorders with an Estriol-Containing Ointment] - [Article in Hungarian*]. *Orv Hetil* 1995 Feb 12;136(7):343-5.

45. *Chandeying V. MD, Sangthawan M. MD. Faculty of Medicine, Prince of Songkhla University, Hat Yai, Songkla, Hat Yai Regional Hospital, Hat Yai, Songkla. Efficacy Comparison of Pueraria Mirifica (PM) Against Conjugated Equine Estrogen (CEE)With/Without Medroxyprogesterone Acetate (MPA) in the Treatment of Climacteric Symptoms in Perimenopausal Women: Phase III Study. J Med Assoc Thai* 2007; 90 (9): 1720-6.

46. Chandeying V. MD, Lamlertkittikul S, Lamlertkittikul P, Schauss Alex. Faculty of Medicine Prince of Songkla University, Hat Yai, Thailand, Hat Yai Center Hospital, Hat Yai, Thailand. *Efficacy and Safety of Pueraria Mirifica (Kwao Keur Kao) for the Treatmen of Vasomotor Symptoms in Perimenopausal Women: Phase II Study.*

47. Smitasiri Yuthana, Professor, Mae Fah Luang University, Chiang Rai, Thailand *Are White Kwao Krew Products Interesting for Use?* September 13, 2002

48. Somkhit Banomyong. *Secrets of Pueraria Mirifica Revealed* April 11, 2001

49. Premarket Notification for Pueraria Candollei var. Mirifica Root Extract As a Dietary Ingredient. A Paper

50. The Science Behind Pueraria Mirifica. A Paper

51. Thai Patents on Kwao Krua (Pueraria Mirifica). Book Excerpt, Pages 51-54.

52. *The Ingredient of Pueraria Tuberous Root.* Luang Anusarnsoondhorn Upasipong Printing May 15, 1931

53. *Revision of the Genus Pueraria DC. With Some Notes On Teyleria Backer.* (Leguminosae) Van Der Maesen, L.J.G. Agricultural University Wageningen, The Netherlands 1985.

54. Subcharoen, Pennapa, Deputy Director-General, Department for Development of Thai Traditional and Alternative Medicine, Chthaputti, Anchalee, Senior Pharmacist, Institute of Thai Traditional Medicine, Ministry of Public Health, Thailand. *Thai Traditional Medicine Kingdom of Thailand*

55. Pilling David, Bardacke Ted. *Genetic Pirates Walk the Plank.* Financial Times, January 9, 1999 Page 7.

56. *Pueraria Mirifica "Kwao Kreu Kao" Rejuvenating Herbal Products*. Thailand Medicinal Plant Research Institute, Department of Medical Sciences, Ministry of Public Health, Thailand July 2000.

57. Subcharoen Pannapa Dr., Jaidee Vichaya Mrs. *Thai Wisdom for Global Health.*The Thai Traditional Medicine Development Foundation Ministry of Public Health, Thailand July 2004

58. Mirhom Yossef , Ph.D. *Pueraria Mirifica "The Miracle Root".*