

INFORMATION ON JAVA TEA

Java Tea (*Orthosiphon Stamineus*) is a medicinal herb trusted for many centuries for treating ailments of the kidney, bladder stone, urinary tract infection, liver and bladder problems, diabetes, rheumatism and gout. It is also used to reduce cholesterol and blood pressure.

Java Tea has a mild diuretic action, useful for flushing the kidneys and urinary tract. It also relieves spasms of the smooth muscle in the walls of the internal organs, making it valuable for gallbladder problems. Researchers have found it to be mildly antiseptic as well.

Java Tea is herbaceous shrub, found mainly throughout South East Asia, which grows to a height of no more than 1.5 meter, producing a unique blue to light violet flowers that looks like cat's whiskers.

Java Tea is locally known as ***Misai Kucing*** (*misai kucing*), ***Kumis Kucing*** or ***Remujung***. Other names for Java Tea are *Orthosiphon Stamineus Benth*, *Orthosiphon Aristatus*, *Orthosiphonblaetter*, *Javatee*, *Indisher Nierentee*, *Feuilles de Barbiflore*, *Kidney Tea*, and *Yaa Nuat Mao*.

The plant is from the family of *Lamiaceae / Labiatea*.

Traditional Medicine

Java Tea has long been used in traditional medicine in South East Asia.

It is believed to have antiallergic, antihypertensive, antiinflammatory and diuretic properties. It is used as a remedy for arteriosclerosis (capillary and circulatory disorders), kidney stones and nephritis. It is also used traditonally for treating gout, diabetes and rheumatism. The leaves are also used as a diuretic and for treating catarrh of the bladder. A decoction prepared from the plant is used to eliminate stones in the bladder.

List of active substances in Java Tea and their Benefits for Health

#	Active Substance	Pharmacology Actions / Biological Activities	
1.	Beta-caryophyllene	<u>Anti-Inflammatory Agents (non-steroidal)</u> Antibacterial	Anti-inflammatory agents that are not steroids. In addition to anti-inflammatory actions, they have analgesic, antipyretic, and platelet-inhibitory actions. They are used primarily in the treatment of chronic arthritic conditions and certain soft tissue disorders associated with pain and inflammation.
2.	Alpha-humulene	<u>Antitumor</u> Antibacterial	<u>Possible inducer of action</u> of antitumor activity.
3.	Caryophyllene epoxide	<u>Fungicidal, Anticholinesterase</u>	Fungicidal - Inhibits the growth of fungus. Anticholinesterase - inhibits the activity of cholinesterases, including acetylcholinesterase.
4.	Eupatorin	#Antibacterial; Anticarcinomic; Antimalarial; Cytotoxic; Emetic; Immunostimulant;Parasiticide; Plasmodicide;	An antioxidant. A <u>flavonoid</u> that prevents <u>oxidative inactivation of 15-lipoxygenase</u> .
5.	Sinensetin	Fungicide, Pesticide	<u>Antiadhesive</u> action on platelet
6.	Scutellarine tetramethyl ethers		
7.	Salvigenin		<u>Relaxant</u>
8.	7,3',4'-tri-O-methyluteolin		
9.	5-hydroxy-6, 7',3',4'-tetramethoxyflavone		Possible use in <u>reducing and preventing cardiovascular diseases and disorders</u>
10.	Ladanein		
11.	6-hydroxy-5, 7',4'-trimethoxyflavone		

12.	2,3-dicoffeoyltartrate		
13.	Rosmaric acid		Antiphlogistic, antiexudative, antiinflammatory, antiallergic, <u>antioxidant</u>
14.	2-caffeoyltartrate		
15.	Terpenoids		*under investigation for antibacterial, antineoplastic
16.	Diterpene ester		
17.	Orthosiphole A to E (diterpene dibenzoyl diacetyl ester of primarane type)		
18.	Neoorthosiphol A and B	<u>Antihypertensive</u>	Treatment for hypertension
19.	Orthosiphole F to J		
20.	Staminol A and B		
21.	Norstaminol A		
22.	Orthochromene A (benzochromene)	<u>Antihypertensive</u>	
23.	Aglycone hederagenin (Triterpene saponins)		Sapogenin glycosides. A type of glycoside widely distributed in plants. Each consists of a sapogenin as the aglycon moiety, and a sugar. The sapogenin may be a steroid or a triterpene and the sugar may be glucose, galactose, a pentose, or a methylpentose. Sapogenins are poisonous towards the lower forms of life and are powerful hemolytics when injected into the blood stream able to dissolve red blood cells at even extreme dilutions.
24.	Alpha-carotene	Antioxidant. Anti-carcinogenic. #Anticancer (liver/lung/skin)	A carotenoid. Carotenoids are called "provitamin A" because the body can convert them into retinol, an

			<p>active form of vitamin A.</p> <p><u>Carotenoids</u> can protect cells from the damaging effects of free radicals, provide a source of vitamin A, enhance the functioning of your immune system and your reproductive system function properly.</p> <p><u>Cancer prevention</u>, ten times more anti-carcinogenic/anti-proliferant than beta-carotene.</p>
25.	<u>Beta-carotene</u>	<p>#Allergenic; Androgenic?; AntiPMS; Antiacne; Antiaging; Antiasthmatic; <u>Anticancer</u>; Anticarcinomic; Anticoronary; Antihyperkeratotic; Antiichthyotic; Antileukoplakic; Antilupus; Antimastitic; Antimutagenic; Antioxidant; Antiozenic; Antiphotophobic; Antipityriasis; Antiporphyrin; Antiproliferant; Antipsoriatic; Antiradicular; Antistress; Antitumor; Antiulcer; Antixerophthalmic; Cancer-Preventive; Immunostimulant; Interferon-Synergist; Mucogenic; Phagocytotic; Prooxidant; Thymoprotective; Ubiquitous;</p>	<p>A carotenoid that is a precursor of VITAMIN A. It is administered to reduce the severity of photosensitivity reactions in patients with erythropoietic protoporphyria (PORPHYRIA, ERYTHROPOIETIC). (From Reynolds JEF(Ed): Martindale: The Extra Pharmacopoeia (electronic version). Micromedex, Inc, Engewood, CO, 1995.)</p> <p>Claims that beta-carotene is effective as a sunscreen have not been proven. Although beta-carotene supplements are being studied for their ability to reduce the risk of certain types of cancer and possibly heart disease, there is not enough information to show that this is effective.</p> <p>Believed to enhance the function of the immune system. Involved with growth & tissue repair.</p>
26.	<u>Cryptoxanthin</u>	<p><u>Anticarcinogenic Agents</u>, Antimutagenic</p>	<p>Prevent or reduce the development of cancer</p>
27.	Beta-zeacarotene	Antioxidant	<p>A carotenoid. Carotenoids are called "provitamin A" because the body can convert them into retinol, an active form of vitamin A.</p>

28.	Neo-beta-carotene	Antioxidant	A carotenoid.
29.	Alpha-carotene oxide		
30.	Vomifoliol		
31.	Aurantiamide acetate		<p><u>*A selective cathepsin inhibitor.</u></p> <p><u>It has been tried giving a broad-spectrum cathepsin inhibitor to some cancerous mice and found that it slowed tumor development both in early and late stages of growth with no apparent side effects.</u></p>
32.	Oleanolic acid		<p>Abortifacient; Anti-HIV EC50=1.7 ug/ml; <u>Anti-HIV</u> <u>Antidiabetic</u></p>
33.	Ursolic acid	<p>#Analgesic; <u>Anti-HIV</u> EC50=2.0 ug/ml; Anti-HIV IC50=6.5 ug/ml; Anti-HIV IC85=18 ug/ml; AntiEBV; Antiarthritic; Anticariogenic; Anticholestatic 28-100 mg/kg orl; Antidiabetic; Antiedemic; Antihepatotoxic 5-20 mg/kg ipr; Antihistaminic; Antihyperlipidemic; Antiinflammatory 1/3x indomethacin; Antiinflammatory IC24=500 mg/kg; Antileishmanic ED50=20 uM; Antileukemic; Antilymphomic; Antimutagenic; Antiobesity?; Antioxidant; Antiproliferative IC50=15-20 uM; Antistaphylococcic; Antitumor; Antitumor (Breast) 0.5% diet; Antitumor (Breast) IC50=15-20 uM; Antitumor (Colon); Antitumor (Lung); Antitumor (Stomach) IC50=15-20 uM; Antitumor-Promoter; Antiulcer; Antiviral IC85=18 ug/ml; Aromatase-Inhibitor; CNS-</p>	

		Depressant; Cancer-Preventive; Choleric 5-20 mg/kg orl; Cytotoxic 50 ppm; ED50=3.75 ug/ml; Diuretic; Hepatoprotective; Hypoglycemic; Lipoxygenase-Inhibitor IC50=0.18 mM; Piscicide; Potassium-Sparing 3 mg/rat; Protease-Inhibitor IC85=18 ug/ml; Protisticide; Sodium-Sparing 3 mg/rat	
34.	Betulinic acid	Anti-Inflammatory Agents, Non-Steroidal, Antimalarials Antineoplastic Agents, Phytogenic Prostaglandin Antagonists Anti-HIV Agents	
35.	Beta-sitosterol	Antilipemic Agents	Substances used to treat HYPERLIPIDEMIA. (An excess of lipids in the blood). Beta-sitosterol has possible activity in promoting prostate health . It also has cholesterol-lowering activity.

List of Active Substances of *Orthosiphon Stamineus Benth* (Misai Kucing) courtesy of [Global Information Hub on Integrated Medicine](#)
 # Part of the activities list of certain chemicals above are courtesy of Dr. Duke's [Phytochemical and Ethnobotanical Databases](#)

WARNING: Do not consult this list unless you agree not to hold the compilers or host liable for any errors or omissions. The compilers do not recommend self diagnosis or self medication; the compilers do urge serious studies of herbal alternatives, believing that in many cases, the herbal alternative may contain several synergistic compounds that will, in fact, do what empirical trials have suggested, as recorded in the folklore.

RESEARCHES ON JAVA TEA

Java Tea began to interest researchers as early as the beginning of the 20th century when this plant was introduced to Europe where it became a popular herbal tea.

Nowadays, the consumption of herbal based products are getting a wide spread acceptance among consumers because of the numerous beneficial therapeutic impacts they could give to our body and indirectly helps us sustaining a healthy condition. Although artificial and synthetic drugs are common in the market to combat a lot of chronic diseases, but these medications usually have negative effects to our body. Therefore, products from herbs, especially the Misai Kucing (*Orthosiphon stamineus*) are the right choice in treating certain kinds of ailments or diseases without introducing side effects to our body if consumed accordingly based on scientific findings and research. This is where our herbal products comes in which are confidently introduced to the public and backed by scientific research and findings from local and overseas scientist to prevent, reduce or to the extent in aiding the cure of certain types of chronic diseases or ailments.

According to Anon (2001), the scientific term of *Orthosiphon stamineus* have other synonyms such as *Orthosiphon aristatus*, *Orthosiphon grandiflorum* and *Orthosiphon spicatus*. This herb is also known by its vernacular names such as Java tea (English), Thé de Java (France), kumis kucing (Indonesia), kumis ucing (Sudanese), remuk jung (Javanese), kumis kucing or misai kucing (Malaysia), balbas-pusa and kabling-gubat (Philippines), kapen prey (Cambodia), hnwàd méew (Laos), yaa nuat maeo (Thailand) and r[aa]u m[ef]o in Vietnam. This herb (Misai Kucing known in Malaysia) is distributed from India, Indo-China and Thailand through Malaysia to tropical Australia. Through out Malaysia, it occurs as a wild plant but is apparently rare in Borneo, Sulawesi and the Moluccas. It is now grown in South East Asia, Africa, Georgia and Cuba.

Based on Hegnauer (1966) and Wangner (1982), the tea prepared from the leaves is used in beverages in Malaysia to improve health and for the treatment of kidney, bladder inflammation, gout and diabetes. Most land plants contain a chemical compound known as phenolics which are a class of low molecular weight secondary metabolites. Most of the protective effects of flavonoids (a class of phenolic compound) in land plants in biological systems is ascribed to their antioxidant abilities, capacity to transfer electrons, free radicals and chelating abilities (Hirano et al., 2001), activate antioxidant enzymes, reduce alpha-tocopherol radicals and inhibit oxidases (Elliott et al., 1992). According to Tezuka et al. (2000), this herb contains several active chemical compounds such as terpenoids (diterpenes and triterpenes), polyphenol (lipophilic flavonoids and phenolic acids) and sterols. The antioxidant capabilities of the phenolic compounds are important for the human body to destroy the free radicals that exists in our body. The existence of free radicals in a large quantity in our body could have the ability to destroy the structure and the inner part of our living cells, including genetic compounds (DNA) that could lead to cancer. Besides that, free radicals could also weaken the artery walls that will allow fat deposits to occur and leading to heart disease. In fact, the dried leaves and stem tips of Misai Kucing contains up to 12% minerals, inositol, phytosterols, saponins and up to 0.7% essential oils (Anon, 2001).

The therapeutic effects of *Orthosiphon stamineus* have been ascribed mainly to its polyphenol, the most dominant constituent in the leaf which has been reported by Hollman & Katan (1999) to be effective in reducing oxidative stress by inhibiting the formation of lipid peroxidation products in biological systems which could lead to some of the chronic diseases such as coronary heart disease and many more. This is proved by the research of Chung et al. (1999) and Venkatamuru et al. (1983) which among the different parts of plants studied, the leaves are reported to have the highest antioxidant properties whereby the phenolic fraction is the most active principle among the phytochemicals studied (Nakasugi & Komai (1998); Jung et al. (1999) & Pietta et al. (1998)). That's why the leaves of this herb is often used in traditional medicine and also in our product (Reeleaf tea and MissKuu tablets) compared to other parts of the plant because it contains much more active chemical components which contributes to the therapeutic benefits.

The specific polyphenol components that are dominant in the leaves of the Misai Kucing herb consists of three main polymethoxylated flavones, which are sinensetin (SEN), eupatorin (EUP), 3'-hydroxy-5,6,7,4'-tetramethoxyflavone (TMF) and rosmarinic acid (RA), which is the major phenolic acid. Based on the studies by Akowuah et al. (2004), the RA component is the main polyphenol compound in the leaves of Misai Kucing, which is the most polar (water soluble) component compared to the three polymethoxylated flavones studied. The extract of the leaves of Misai Kucing using polar extracting solvents gave the highest activity of free radicals scavenging which is possibly due to the high concentration of caffeic acid derivatives, especially RA (Akowuah et al., 2005). Based on Sumaryono et al. (1991), the derivatives of caffeic acid, including RA was reported to constitute 67% of total identified phenolics in aqueous methanol extract and about 94.6% in hot water extract. Therefore, by using the leaves of Misai Kucing in the form of tea drinking or tablets and capsules which contain the extract of the herb is beneficial for health, especially when the active chemical components from the leaves are extracted using polar solvents.

Java tea has also been demonstrated to exhibit antimicrobial properties (Anon, 2001). Aqueous extracts of this herb had markedly inhibited the growth of both gram-positive and gram-negative bacteria during in vitro tests. It is concluded that saponins may play a part in bacteriostatic activity of this herb. Besides that, caffeic acid derivatives (which represent as much as 95% of the phenolic substances present in a hot water extract) may also be responsible for the antibiotic activity. Therefore, by consuming this herb in the form of hot water extract (tea drinking) or tablets and capsules which contain the same amount of active ingredients may be beneficial for the elimination of various kinds of pathogenic and harmful micro-organisms.

Orthosiphon stamineus is widely used in Malaysia as a traditional remedy for various ailments and diseases such as kidney stones, high blood pressure, diabetes, rheumatism, arthritis, gout and possibly other ailments as well. Besides of aiding in the cure of various types of illnesses, the extract of this herb if consumed can also increase the body's metabolism which translate into more calories burned and triggers the body to sweat more. The mode of action of the Misai Kucing extracts in reducing or to the extent of helping to cure the diseases mentioned are described as follows:

1). Kidney Stones

Kidney stones are referred to the crystals of minerals that are produced and somehow stored and stucked in the kidneys. Because of this, the people who suffer from this condition will feel pain and discomfort, especially in the area surrounding the kidneys. The lack of consuming water is one of the factors that may contribute in the forming of kidney stones. When water is consumed less, the output of urine will tend to become more concentrate than usual and this situation will make the formation of kidney stones more possible to develop and the risk of getting it is increased if a person doesn't urinate often.

Based on Anon (2002) from the research by Dr. Sahabudin Raja Mohamed, senior consultant urologist at Hospital Kuala Lumpur, O stamineus extract inhibits calcium oxalate crystal aggregation by reducing crystal size and altering its surface. Crystal growth is inhibited by the reduction in retention time through diuresis with increasing potassium excretion. In addition, spontaneous voiding of stones less than five millimeters is also induced. The extract also reduces uric acid level by blocking its production. About 50% to 60% of kidney stones are calcium oxalate stones while 20% to 30% are uric acid stones. The inhibition of kidney stones is also made possible by the Misai Kucing extract due to the abundant levels of minerals and flavonoids in it. The minerals will form crystals of oxalate, uric or phosphate salts while the flavonoids acts as a chemical inhibitor to prevent the growth and aggregation of the crystals. Therefore, the existence of a promoter (minerals) as a former of the oxalate salt nuclei and the inhibitor (flavonoids) is very important and needed to control the growth of the referred salt crystals. Besides that, the diuretic effect of the extract of Misai Kucing also helps to prevent kidney stone development due to the increase in urine flow which makes static urine confinement in the kidneys and urine bladder lessen to occur which have been proven by Beaux et al. (1998) through rat study. The diuretic effect could be partially due to the high content of potassium (kalium) in the leaves and the presence of inositol (and possibly saponins), as well as to the isolated flavones sinensetin and 3'-hydroxy-5,6,7,4'-tetramethoxyflavone which exhibited a diuretic activity in rats after intravenous administration of 10mg / kg body weight of Misai Kucing extract (Anon, 2001).

From the research mentioned, it is convincing that the extract from Misai Kucing does help inhibiting the development of kidney stones. Although the extract has a diuretic effect by nature, the potassium (kalium) level in the body will not decrease down to a depleting level because of the high concentration of this mineral in Misai Kucing, that is around 600 – 700mg per 100g of fresh leaves (Anon, 2001).

2). High Blood Pressure

Blood pressure is defined as the force the blood exerts on arteries and veins as it circulates through the body. Blood pressure is measured as two numbers. Systolic pressure (the top number in a reading) denotes when the heart contracts and forces blood through the arteries while diastolic pressure (the bottom number) reflects when the heart relaxes. Normal blood pressure is 120 (systolic) over 80 (diastolic) or lower. High blood pressure is also synonym or most commonly known as hypertension. It is characterized by a systolic and diastolic reading of 140 over 90 or higher respectively in at least three separate measurements.

The extracts of Misai Kucing is very well known for its ability to lower down blood pressure in hypertensive patients and it has been practiced for generations by traditional medicine practitioners. According to a research by Ohashi et al. (2000), from the water decoction of leaves of Kumis Kucing that was partitioned into a mixture of chloroform and water, it was found that the chloroform-soluble portion showed an inhibitory effect on the contractile responses on rat thoracic aorta smooth muscle stimulated with potassium chloride (KCl) beforehand. The chloroform-soluble portion produce 13 chemical compounds and among these compounds, it was found that a major constituent in the water decoction of leaves, methylripariochromene A (5), exhibited a continuous decrease in systolic blood pressure after subcutaneous administration in conscious stroke-prone spontaneously hypertensive rats (SHRSP). This proves that the extract of *Orthosiphon stamineus* or in this research the synonym of it, that is the *Orthosiphon aristatus* can aid in reducing the blood pressure of rats in this case and certainly can be applied in humans as well.

The factor that might possibly reduce the blood pressure in hypertensive patients is from the antioxidant ability of the Misai Kucing extract. Through the research from Lopes et al. (2002), they found that the high antioxidant diet lowered blood pressure in obese hypertensive but not in lean normotensive respondents (humans). The increase of Total Antioxidant Capacity (TAC) of plasma in obese hypertensives during the High Antioxidant (HAO) diet correlated with the decline in blood pressure. Changes of dietary cations measured in the urine did not change significantly in respondents with risk factor cluster (OHT). These findings raise the possibility that the Dietary Approaches to Stop Hypertension (DASH) diet reduces blood pressure in high-risk subjects in significant part through an antioxidant action. According to Akowuah et al. (2005), from the results obtained through the research, they found that the extracts of *Orthosiphon stamineus* are free radical inhibitors and primary antioxidants that react with free radicals and probably due to the higher concentration of caffeic acid derivatives, especially rosmarinic acid (RA).

According to the research of Beaux et al. (1998), by feeding rats with the extract of *Orthosiphon stamineus* and *Sambucus nigra*, they found that the urinary excretion of sodium (natrium / Na) was increased. As we know, hypertension is related to the high intake of salt (natrium chloride / NaCl). Therefore, by excreting excess sodium through the urine will definitely reduce the blood pressure in hypertensive patients.

Therefore, the extract of Misai Kucing is a very good herb for the treatment of hypertension based on the research mentioned. From the research of Lopes et al. (2002), we can say that the lowering ability of the blood pressure from the extract is not attributed by its diuretic ability but mainly from its antioxidant content. This herb is rich in polyphenols which are a great source of antioxidants.

3). Diabetes

A person with diabetes doesn't produce enough of the hormone insulin or is unable to use it effectively, which causes high blood sugar (glucose) levels. Over time, this imbalance can lead to heart disease, nerve damage, kidney disease, vision loss and various other complications. There are two types of diabetes. Less common is insulin-dependent diabetes (type 1) which usually develops before the age of 30. Non-insulin-

dependent diabetes (type 2) accounts for 90% of cases which it usually appears after the age of 40.

Based on a local research done by Mariam et al. (1996) from Universiti Sains Malaysia, Penang, they found that significant hypoglycaemic effect was observed in normal rats treated orally with 1.0g / kg of body weight of the *Orthosiphon stamineus* extract. In addition to that, the hyperglycaemic effect induced by streptozotocin was also inhibited by the same dose of the same extract. From the results obtained from this research, it can be concluded that the aqueous extract of local Misai Kucing possessed some hypoglycaemic activities in both normal and streptozotocin-induced diabetic rats in lowering the blood sugar level. Further studies are needed to identify the active principles responsible for this activity and evaluate its mechanism of action. From a couple of testimonials obtained from local people who consume this herb in the form of tea drinking or tablets said that they are prone to sweat more because of the heat generated inside the body. Some of them even had loss weight through consumption of this herb. Somehow there's a chemical compound in the extract which increases the body's metabolism and uses the glucose in the body to generate energy which indirectly will help diabetic patients. Therefore, this herb is potential in lowering blood glucose level in diabetic patients.

4). Rheumatoid Arthritis

Rheumatoid arthritis is a chronic disorder in which the cartilage and tissues in and around the joints become inflamed and damaged. Scar tissue replaces the damaged tissue, narrowing the spaces in the joints and limiting movement. Some people experience only mild joint stiffness, punctuated by periodic inflammatory flare-ups. In others, however, symptoms are persistent and worsen over time, causing deformities of the hands and feet. In very severe cases, rheumatoid arthritis can also affect the heart, lungs, muscles and skin.

The extract of Misai Kucing is rich in polyphenolic compounds (flavonoids) which are also high in antioxidant activities. Among the functions of antioxidants is to protect cells in the body from damages due to free radicals and also acts as an anti-inflammatory agent. According to Hegnauer (1966) and Wangner (1982), the leaves of Misai Kucing are used to prepare a diuretic tea, which has been reported to be active against kidney and bladder inflammation. The extract helps in reducing the inflammation surrounding the joints and because of the powerful antioxidant properties exhibited by the extract as proven by the research of Akowuah et al. (2005) which is comparable with Quercetin (a powerful antioxidant most commonly found in onions and grapes) and more powerful than BHA (butylated hydroxy-anisole, which is a synthetic antioxidant), the antioxidant components in the extract work to protect cells, including those in the joints, from damage.

Because of the antioxidant and anti-inflammatory properties exhibited by the extract of Misai Kucing, it certainly can reduce the symptoms of rheumatoid arthritis in a natural way without using synthetic drugs and medications.

5). Gout

Gout is a metabolic disorder linked to high levels of uric acid in the blood. Uric acid, a by-product of various body processes, is also formed after eating certain foods. The body rids itself of uric acid through the urine. But some people produce too much uric acid – or can't dispose of it fast enough – and levels build up. Often, the excess uric acid is converted into needle-shaped crystals that settle in and around joints and other tissues, triggering inflammation and the excruciating pain associated with gout.

Based on Anon (2002), according Dr. Sahabudin Raja Mohamed, senior consultant urologist at Hospital Kuala Lumpur, the extract of *Orthosiphon stamineus* also reduces uric acid level by blocking its production. Besides blocking the production of uric acid, the main cause of gout, Misai Kucing extract contains a high level of antioxidants which will inhibit the inflammatory of the joints associated with gout. Thus, the extract will reduce the pain surrounding the joints involved. In fact, the extract exhibit diuretic ability which will flush out excessive uric acid in our body to prevent them from accumulating in the joints to form harmful crystals.

Overall, this type of herb (*Orthosiphon stamineus*) or well known as Misai Kucing in Malaysia is already been used for generations for healthy living and also in aiding the cure of certain types of illnesses and ailments as mentioned. In terms of its safety, so far there are no bad side effects regarding the consumption of this herb if taken accordingly. This is proven by Dr. Sahabudin himself where toxicology studies in the Institute for Medical Research (IMR), Ministry of Health (MOH), Malaysia have confirmed the extract is safe. The *O. stamineus* extracts had non-injurious effects on rats that were fed up to five grams (Anon, 2002). Taking natural herbs as supplements is a good thing to do and practice as they contain a lot of beneficial natural chemical compounds, where mostly are regarded as antioxidants. Due to some safety concerns in synthetic antioxidants, a good deal of attention has been focused on the anti-oxidative compounds present in plant-derived foods (Imaida et al., 1983). Consuming as much antioxidants as possible is important because Niwa (1997) suggested that oxygen radicals cause 90 per cent of illnesses and diseases which antioxidants can fight against.

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Scientific research on Java Tea has begun since 1970 (Van der Venn: *Pharmaceutisch Weekblad*), (Schmidt and Bos, Walter de Gruyter & Co., Berlin/New York: *Volatile of Orthosiphon Stamineus Benth, Progress in Essential Oil Research*), (Massuda T: *A Highly Oxygenated Diterpene From Orthosiphon Stamineus, Tetrahedron Letter*).

In Malaysia, research institutes such as the Institute of Medical Research and the Kuala Lumpur Hospital of the Malaysian Health Ministry are participating actively in conducting clinical study to prove the efficacy of Java Tea in treating kidney stone disease. The School of Pharmaceutical Sciences, Universiti Sains Malaysia contributes to the scientific research and development of Java Tea by conducting the extraction, quality

control, standardization, pharmacological and formulation research. The source: <http://www.mdpi.net/sensor/papers/s31000458.pdf>

Orthosiphon Trial: The Clinical Research Centre, Ministry of Health Malaysia undertook a study to determine the efficacy of Orthosiphon Stamineus (Misai Kucing) (200 mg/day) compared to placebo for a treatment period of 24 months in patients with Idiopathic hypocitraturic, hyperuricosuria, hyperoxaluric calcium nephropathies and hyperuricaemic nephropathies with respect to urinary tract stone formation rate. The source: <http://www.crc.gov.my/research/orthosiphon.htm>

Universiti Sains Malaysia have received grants totaling RM 12.5 million from the Ministry of Science, Technology and Environment Malaysia. A Clinical Study of Standardised Misai Kuching was carried out for kidney stone disease and upscaling it from laboratory to Pilot Scale Production. The objective of the research is to develop a cure for several diseases such as gout, arthritis, rheumatism, inflammatory conditions and kidney stones. The cure was astonishingly produced from a local herb called Misai Kuching . The source: <http://www.usm.my/r&d/frontiers/f1/6.html>

In Vitro Plant Culture Technology on Misai Kucing and other Malaysian herbs : by Chan Lai Keng, PhD, Universiti Sains Malaysia. Research on micropropagation and the production of useful active compounds from various medicinal plants have been and are currently carried out in our laboratory using various in vitro culture techniques. The source : http://www.symbiosisonline.com/jun03_invitro.html

In Japan, in a study on the antihypertensive substance in the leaves of Java Tea by the Faculty of Pharmacy and Pharmaceutical Sciences, Fukuyama University, exhibited a continuous decrease in systolic blood pressure, a decrease in cardiac output and diuretic action in conscious stroke-prone hypertensive rats. The source: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10825811&dopt=Abstract
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In Indonesia, the National Cardiovascular Center Harapan Kita (Pusat Jantung Nasional Harapan Kita) has conducted a clinical observation on the effectiveness of the consumption of Java Tea traditional medicine by the wide population in treating hypertension. The source: http://members.bumn-ri.com/pjn-harapan-kita/news.html?news_id=1407
<http://www.dnet.net.id/kesehatan/kiatalami/detail.php?id=1561>
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Ask your doctor or pharmacist if you need more information about any treatment or if any information in this article concerns you.