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Review of Ingredients in Syphos Tonic to Improve Blood Circulation

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Abstract **Review Article**

Syphos herbal mixture is an herbal product formulated to improve blood circulation. The product after successfully passing the toxicity and microbial analysis has been submitted to the Food and Drugs Authority (FDA), Ghana, for registration as natural tonic to improve blood circulation. The basis of this blood circulation ability is dependent on the active ingredients in the product. This paper therefore reviews the active ingredients used in the product formulation for blood circulation.

Key words: Syphos, Tonic, Blood, circulation, herbal drug.

INTRODUCTION

Having efficient circulation is crucial for maintaining good health. It allows nutrients, blood and oxygen to reach parts of the body. When blood flow to specific areas of the body is reduced, this is referred to as poor circulation. This is more likely to occur in the extremities, such as the arms and legs. Interestingly, some people notice they have poor circulation and experience little side-effects. However, for many people poor circulation can result from more series health conditions such as diabetes, peripheral artery disease or blood clots. Though, conventional pharmaceutical drugs have been used for many years for improving blood circulation, there are alternative and effective natural ways that could be used to also deal with poor circulation. One alternative ways is the use of herbal medicines.

Herbs can be used to aid in healthy circulation and are often acting on the underlying reasons why this is occurring in the first place.

Common symptoms of poor circulation include

- Inflammation of the extremities
- Chronic infections
- Impaired cognitive function
- Tingling and numbness
- Cold hands or feet
- Throbbing or stinging pain in your limbs
- Muscle cramps

Causes of poor circulation

According to medical science, there are several different causes of poor circulation. Some of the main reasons include the following:

- Varicose veins. These are enlarged, knobbly looking veins that usually occur on the legs. They are caused by faulty valves in the veins themselves, which allow the blood to flow backwards and pool leading to poor venous circulation.

Genes on the other hand can largely determine if one will develop varicose veins, however being overweight or obese are other risk factors.

- Obesity. Carrying extra weight puts extra stress on the body. On the other hand, too much sitting or standing for extended periods, may led to

circulation problems. Being overweight or obese puts one as well at higher risk of atherosclerosis, high blood pressure, high cholesterol, diabetes and varicose veins.

- Peripheral artery disease (PAD). This circulatory condition causes narrowing of the blood vessels and arteries which can lead to poor circulation to the legs. It is associated with atherosclerosis where the arteries stiffen due to a build-up of plaque. Over time this reduced flow of blood can cause numbness, tingling and nerve and tissue damage in the extremities. PAD puts one at higher risk of heart attack and stroke.
- Diabetes. Although diabetes is related to blood sugar irregularities it is also commonly associated with poor circulation. People with diabetes are at a higher risk of high blood pressure, atherosclerosis and heart disease. A common complication of diabetes, diabetic neuropathy can lead to reduced sensation in the extremities.
- Blood clots. These block the flow of blood in the blood vessels and can occur almost anywhere in the circulatory system. If they occur in the arms and legs they can lead to circulatory problems. Blood clots can develop due to many reasons and can be potentially serious—leading to stroke in some instances.
- Raynaud's disease. The characteristic symptom of this disease is chronic cold hands and feet. This disease causes the small arteries in your hands and toes to narrow, causing impaired blood flow to these areas. Women are more likely to develop Raynaud's disease as well as people living in colder climates

DISCUSSION

Syphos Tonic has seven (7) plant ingredients used in the formulation for blood circulation. The ingredients are:

i. Medicago sativa
ii. Vetiveria zizanioides
iii. Polyalthia Longifolia
iv. Annona Muricata
v. Eleusine indica leaves
vi. Tetrapleura tetraptera and
vii. Garcinia mangostana seed.

The discussion will base on the seven (7) ingredients based on scientific studies for its use to improve blood circulation.

MEDICAGO SATIVA

Alfalfa or green gold is one of the medicinal plants that are used in traditional medicine due to being high in protein, calcium, and vitamins and also its low percentage of cellulose [6, 7]. It contains many enzymes, including amylase, invertase, and pectinase, so it can be used as digestive aids according a 1984 research study by Elakovich and Hampton [4]. Also, more than 20% of dry weight of alfalfa is protein, and it is the best source of Arg, His, Asp, Phe, and Cys amino acids. Alfalfa has an extremely high nutritive value; it includes vitamins A, B1, B6, B12, C, D, E, and K, niacin, pantothenic acid, biotin, folic acid, minerals, protein, and beneficial saponins according to a 1996 study by Zargari A[5].

Also according to the nutritiondata.self.com/

They are typically high in vitamin K and also contain many other nutrients, including vitamin C, copper, manganese and folate. Alfalfa sprouts contain the same nutrients and are also very low in calories. For example, 1 cup (33 grams) of alfalfa sprouts contains a mere 8 calories. It also contains the following:

A serving of 100 grams of alfalfa sprouts have (daily value percentage)

- 23 calories
- 2.1 grams carbohydrates
- 3.99 grams' protein
- 0.69-gram fat
- 1.9 grams fiber
- 30.5 micrograms vitamin K (38 percent DV)
- 8.2 milligrams vitamin C (14 percent DV)
- 36 micrograms folate (9 percent DV)
- 0.2 milligram manganese (9 percent DV)
- 0.2 milligram copper (8 percent DV)
- 70 milligrams phosphorus (7 percent DV)
- 27 milligrams magnesium (7 percent DV)
- 0.1 milligram riboflavin(7 percent DV)
- 0.9 milligram zinc (6 percent DV)
- 1 milligram iron (5 percent DV)
- 0.1 milligram thiamine (5 percent DV)
- 155 IU vitamin A (3 percent DV)

A cup also contains 1 gram of protein and 1 gram of carbs, which comes from fiber. Alfalfa also has a high content of bioactive plant compounds. They include saponins, coumarins, flavonoids, phytosterols, phytoestrogens and alkaloids. Previous studies showed that adding alfalfa seed in human diet reduced triglycerides and LDL, improved HDL levels, and decreased blood glucose. Therefore, alfalfa leaves are traditionally used in South Africa as an effective treatment for diabetes. Alfalfa causes stimulation of insulin secretion. It also improves insulin function in reducing the plasma glucose, but its effects on the blood lipids have not been investigated widely in conclusion, Alfalfa has been shown to help lower cholesterol, and may also have benefits for blood sugar control and relieving symptoms of menopause. People also take it for its high content of antioxidants, vitamins C and K, copper, folate and magnesium. Alfalfa is also extremely low in calories.

In a 2015 animal study by Ali Mirzaei *et al.* [1, 2] rats were divided into seven groups each containing six. Extracts were administrated in four groups (two groups for each extract) by single doses of each plant with 200 and 400 mg / kg body weight by (i.p.) route every other day for28 days. Group 1 as negative control received saline (0.5 ml/kg) by (i.p.) route. Positive control received iron dextran 200 mg/kg body weight. Experimental groups 1 and 2 for each plant extract were fed with 200 and 400 mg/kg, hydro-alcoholic extract respectively via (i.p.) route, 1 h after the injection of iron dextran. Standard group was treated with deferoxamine (DF) 50 mg/kg by (i.p.) route1 h after the injection of iron dextran. Serum iron (SI) and serum total iron binding capacity (TIBC) were determined. The serum ferritin was then measured using enzyme immunoassay ELISA kit for rat. For Analysis of data ANOVA test was. The study revealed that Hydro-alcoholic extract of *Medicago sativa* and *Allium porrum* at 400 mg/kg showed significant ($p<0.05$) iron chelating activity compared to control. The plant extracts with dose 200 mg/kg also reduced the iron and ferritin content but the effect was lower level compared to higher doses. The plant extract effects were similar to that of standard drug deferoxamine. Iron and ferritin levels were significantly reduced in experimental groups when compared to positive group especially in Medicago sativap<0.05. There was no difference between standard drugs and last concentration of plant extracts.

In conclusion, protective effect of *M. sativa* and *A. Porrum* against iron overload in rat model was reported. Significant decrease in serum ferritin and iron concentration was reported in iron overload rats which induced by iron dextran.

In another 2015 study by Amraie *et al.* [3] aim to investigate the effect of aqueous extract of alfalfa on blood glucose and serum lipids in alloxan-induced diabetic rats. In this study, 32 female rats (210–250 g) were used which were divided randomly into 4 groups including intact control group, diabetic control group, and 2 diabetic groups which received 250 and 500 mg/kg doses of aqueous extract of alfalfa, respectively. In the diabetic groups, alloxan-monohydrate was injected peritoneally to create diabetic condition. The two last groups orally received aqueous extract of alfalfa for 21 days. At the end of experiment, sugar, cholesterol, triglycerides, high-density and low-density lipoprotein, and aspartate aminotransferase (ALT) and alanine aminotransferase (AST) levels were measured in the samples. Consumption of aqueous alfalfa extract significantly reduced glucose, cholesterol, triglycerides, and low-density lipoprotein (LDL) levels in the diabetic rats but enhanced high-density lipoprotein (HDL) levels. ALT and AST liver enzyme levels were also reduced in blood. Histological examination showed that the aqueous alfalfa extract caused reconstruction of damaged liver and enhanced Langerhans islets' diameter in pancreas. Therefore, all signs of diabetes were improved by oral administration of alfalfa in defined dose.

That being said, some people may need to avoid alfalfa, including pregnant women, people taking blood thinning medications or individuals with an autoimmune disorder. Even though alfalfa needs to be studied a lot more, it does show a lot of promise.

VETIVERIA ZIZANIOIDES

The main action of vetiver oil is on the nervous system and it is both sedating and strengthening in effect. It is excellent in the treatment of depression, nervous tension, debility, insomnia and many stress-related diseases, and acts as an aphrodisiac where there is a clear connection between impotence or frigidity and stress. It may be used in massage blends and the bath; it has a rather powerful smell but is very pleasant when diluted. It stimulates the circulatory system and makes useful massage oil for elderly or debilitated people with poor circulation. It also helps to stimulate the production of red blood cells and is thus beneficial for anemia. It makes a useful warming and

pain-relieving rubbing oil, suitable for deep massage of muscular aches and pains, sprains, stiffness, rheumatism and arthritis. It may be added to sports oil blends and massaged into muscles before and after sports. In skin care, it helps to balance the secretion of sebum. It is also a useful antiseptic and is slightly stringent. It is used in lotions, compresses and baths for the treatment of oily skin, acne and weeping sores [9]. Vetiver oil revitalizes the body by fortifying the red blood corpuscles crucial in transporting oxygen to all parts of the system. Increased blood flow could alleviate muscular aches and pains and said to be useful in cases of rheumatism and arthritis [8].

POLYALTHIA LONGIFOLIA

A 2007 study by Nair *et al.* [10] conducted to assess the hypoglycemic and antihyperglycemic activity of various solvent extracts of Polyalthia longifolia var. pendula leaf extracts was evaluated in alloxan induced experimental diabetes in rats. Diabetes was induced using 180 mg/kg i.p. of alloxan consecutively two times at an interval of 24 h. The test drugs were administered for 7 days. On 8th day various biochemical parameters like serum cholesterol, serum urea, serum creatinine, serum triglyceride, total serum protein, serum alkaline phosphatase, blood glucose and glycogen from liver were estimated. Polyalthia longifolia extracts and powder produced glucose lowering activity. However, the extracts did not modify any of the biochemical parameter significantly. Hence the extracts and crude powder are devoid of anti-diabetic properties, but has gross glucose lowering properties. The presence of anti-hyperglycemic effect against sucrose loading induced hyperglycemia is a significant finding. Now-a-days, it is considered that this effect is most important property in a drug used in diabetes treatment.

ANNONA MURICATA

A 2018 study by Teller *et al*. posits that, traditional medicinal uses of *A. muricata* have been identified in tropical regions to treat diverse ailments such as fever, pain, respiratory and skin illness, internal and external parasites, bacterial infections, hypertension, inflammation, diabetes and cancer. More than 200 chemical compounds have been identified and isolated from this plant; the most important being alkaloids, phenols and acetogenins. Using *in vitro* studies, extracts and phytochemicals of *A. muricata* have been characterized as an antimicrobial, anti-inflammatory, anti-protozoan, antioxidant, insecticide, larvicide, and cytotoxic to tumor cells. *In vivo* studies of the crude extracts and isolated compounds of *A. muricata* were shown to possess anxiolytic, anti-stress, anti-inflammatory, contraceptive, anti-tumoral, antiulceric, wound healing, hepato-protective, anti-icteric and hypoglycemic activities. In addition, clinical studies support the hypoglycemic activity of the ethanolic extracts of *A. muricata* leaves. Mechanisms of action of some pharmacological activities have been elucidated, such as cytotoxic, antioxidant, antimicrobial, antinociception and hypotensive activities. However, some phytochemical compounds isolated from *A. muricata* have shown a neurotoxic effect *in vitro* and *in vivo*, and therefore, these crude extracts and isolated compounds need to be further investigated to define the magnitude of the effects, optimal dosage, and mechanisms of action, long-term safety, and potential side effects. Additionally, clinical studies are necessary to support the therapeutic potential of this plant.

ELEUSINE INDICA

A 2017 study by Ong *et al*. conducted to investigate the lipid-lowering effects of *E. indica* using both *in vitro* and *in vivo* models. The crude methanolic extract of *E. indica* was fractionated using hexane (H-Ei), dichloromethane (DCM-Ei), ethyl acetate (EA-Ei), butanol (B-Ei), and water (W-Ei). All the extracts were tested for antilipase activity using porcine pancreatic lipase. Because H-Ei showed the highest inhibition, it was further subjected to chemical profiling using high-performance liquid chromatography. Subsequently, oral toxicity analysis of H-Ei was performed [Organization for Economic Cooperation and Development guidelines using fixed dose procedure (No. 420)]; efficacy analysis was performed using high-fat diet (HFD)-induced hyperlipidemic female Sprague–Dawley rats. According to the toxicity and efficacy analyses, H-Ei did not demonstrate any noticeable biochemical toxicity or physiologic abnormalities and did not cause any tissue damage as per histologic analysis. Furthermore, H-Ei significantly reduced body weight and improved serum profile and did not show hepatotoxicity and nephrotoxicity based on the serum profile. Moreover, H-Ei alleviated HFD-induced hepatosteatosis and ameliorated induced adiposity in both visceral and subcutaneous adipose tissues. The results demonstrate that H-Ei effectively improved hyperlipidemia. Further studies to explore its possibility as an alternative pharmacologic agent to treat obesity are warranted.

TETRAPLEURA TETRAPTERA

The wealth of prekese as a medicinal plant has been embedded in local and tradition in Nigeria and neighboring parts of Africa for centuries. The therapeutic properties of the plant have been documented since 1948 and authenticated in laboratory and field experiments.

The fruit is conventionally used as spice and as a natural multivitamin. It is rich in protein, lipids, potassium, iron, magnesium, phosphorous, and vitamin C. In Nigeria, it is cooked in soup and fed to mothers to prevent post-partum contraction. In Ghana, prekese has been used to flavor softdrinks. The drink has been approved by the Food and Drugs board, and is marketed to reduce hypertension, decrease the severity of asthma attacks, and promote blood flow. Studies indicate that prekese extract reduces the risk of certain types of ulcer. It can also inhibit the growth of bacteria. Dried fruits

have been powdered and combined in soap bases to include anti-microbial properties. Moreover, the fruit extract can reduce convulsions with its ability to slow down the central nervous system.

A 2017 study by Onuka *et al*. [13] evaluated the effects of *Tetrapleura tetraptera* extracts and clomiphene citrate on leukocyte counts in order to determine whether the varying reproductive hormones secreted in both extracts and drug, and estrous cycle caused alteration in leukocyte counts.

Twenty-eight adult female rats were selectively divided into 4 groups (n=7) according to their estrous phases. The group A served as control. Group B rats were administered 1mg/kg of clomiphene citrate daily. Group C and D rats were administered 50 and 200mg/kg of seed and pod extracts daily. Results showed that total WBC count was significantly reduced (P<0.05) in proestrus Group B. Total WBC, and lymphocyte counts remained unchanged. Neutrophil count was significantly reduced (P<0.05) in estrus Group C. The MID cell count was significantly reduced in estrus Group C and D. The total WBC counts, lymphocyte count, serum FSH, estrogen and glucocorticoid levels were not statistically significant. Serum LH was significantly high (P<0.05) in proestrus Group B. Serum LH was significantly low in estrus Group C and D. Results showed that the significant reduction in the neutrophil in Group D is independent of the hormones and estrous cycle but dependent on dose concentration of *Tetrapleura tetraptera* extract. The significant elevation in MID cell count was associated with significant reduction in LH in Group C and D. However, total leukocyte count and MID cell count were significantly reduced and appeared to be associated with significant elevation in serum LH levels. The present study provides a novel idea of how LH affects MID cell population.

Another 2017 study by Ochuko L.Erukainure examined the antioxidant properties of the extract determined by its ferric reducing activity, 2,2′-diphenyl-1-picrylhydrazyl (DPPH) and nitric oxide (NO) radicals scavenging activities, and the inhibition of lipid peroxidation in hepatic tissues of albino male rats. Preliminary phytochemical screening revealed the presence
of flavonoids, phenols, tannins, saponins, terpenoids an
d phlebotannin. GC–MS analysis revealed the presence of D-fructose, piperazine,
octodrine, glycidol, glyceraldehydes, 6-octadecenoic acid and 9,12-octadecenoic acid, with D–fructose being the most predominant compound. The extract exhibited high antioxidant activities both in vitro and ex vivo, as indicated by its ability to scavenge DPPH and nitric oxide as well as inhibition of lipid peroxidation. This is further portrayed by its ferric reducing activity. These results suggest an antioxidant protective effect of the extract against oxidative hepatic damage and can be attributed to a synergetic action of the identified bioactive compounds.

GARCINIA MANGOSTANA

A 2019 study by Muhamad Adyab *et al*. aimed to investigate the effects of *Garcinia mangostana* flesh (GMF) on biochemical and morphological changes in the liver and kidney of high-fat diet-induced obese rats. In this study, forty healthy Sprague-Dawley rats were randomized into five groups ($n = 8$) with four groups were fed with high-fat diet (HFD) for 10 weeks and a control group was fed with rat chow diet. Supplementation with GMF in obese rats was continued for 7 weeks starting from week 10th after the initiation of HFD at different doses (200 mg/kg, 400 mg/kg and 600 mg/kg). The positive and negative control rats were given distilled water via oral gavage. Plasma lipid profile, antioxidant enzymes and pro-inflammatory markers were determined using commercial kits. Liver and kidney structure were defined by histology.

The result revealed that, the rats fed with HFD for 10 weeks increased plasma LDL-cholesterol, reduced plasma glutathione peroxidase level and had significantly higher body weight compared to normal control rats ($p < 0.05$). Obese rats also showed elevated level of TNF-α and IL-6 after 17 weeks of HFD. Supplementation with GMF for 7 weeks in obese rats reduced their body weight, improved lipid profile, increased total antioxidant capacity and glutathione peroxidase level and lowered plasma pro-inflammatory markers (TNF-α and IL-6) ($p < 0.05$). In addition, GMF supplementation attenuated the abnormalities of the liver and kidney tissue caused by high fat diet.

The findings suggest that supplementation of *Garcinia mangostana* flesh may help in reducing body weight and has the potential to ameliorate the biochemical changes of the high fat diet-induced obesity in rats. Further studies on pharmacodynamic and pharmacokinetic are required before the results are translated to human.

CONCLUSION

There is limited scientific evidence to support the ingredients in Syphos product to improve blood circulation and more research is needed in this regards.

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