



## INVESTIGATE EFFECT OF *GINKGO BILOBA* ON LIPID PROFILE

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### ABSTRACT

The present study was undertaken to investigate the effects of *Ginkgo biloba* on lipid profile. *Ginkgo biloba* leaf extract revealed a hopeful herbal supplement as therapy for Hyperlipidemia and cardiovascular disease.

**Keywords:** *Ginkgo biloba*, Lipid profile.

### INTRODUCTION

Over the past 15 years, there has been a steady growing trend of these unconventional alternative therapies throughout the globe. The European and the U.S. markets contributed to about \$7 and \$5 billion per annum, respectively, in 1999[1] Until 2000, estimates showed that nearly 50 % to 75 % of the U.S. populations have tried complementary and alternative medicine [2].

Ginkgo tree is the only surviving member of Ginkgoaceae family, class of Ginkgoatae, rediscovered in Asian graced temple gardens by Kaempfer in 1670. The class of Ginkgoatae consists of approximately 15 genera, and among these, Ginkgo, Baiera, and Ginkgoites are the most important [3]. The name ginkgo comes from the Chinese words sankyo or yinkuo, which means a hill apricot or silver fruit, due to their apricot shaped mature fruits and yellow color [4]. Englbert Kaempfer, a German surgeon, first used the term "Ginkgo" in 1712, but it was Linnaeus who termed it *Ginkgo biloba* in 1771 [5].

Ginkgo extracted from the leaves of the ginkgo trees is considered nontoxic and is virtually without side-effects. It can be safely used with other supplements without interactions and has no reported toxicity. In rare cases, some gastric upset or incidence of headache or skin rash has occurred, which may indicate that the individual is allergic to the substance. The leaf extract of ginkgo is usually the only form that is available and is extremely safe [6].

The main two pharmacologically active groups of compounds present in the Ginkgo leaf extract are the

flavonoids and the terpenoids [7]. Flavonoids, also called phenylbenzopyrones or phenylchromones. Flavonoids present in the Ginkgo leaf extract are flavones, flavonols, tannins, biflavones (amentoflavone, bilobetol, 5-methoxybilobetol, ginkgetin, isoginkgetin and sciadopitysin), and associated glycosides of quercetin and kaempferol attached to 3-rhamnosides, 3-rutinosides, or p-coumaric esters [8]. The flavonoid content in the Ginkgo leaf is known to vary between seasons; greater amounts are found in fall than in spring. These compounds are known to act mainly as antioxidants, free radicals scavengers, enzyme inhibitors, and cation chelates. Flavonoids in the glycosidic form are poorly absorbed in the intestine; only in the aglycone form can they be absorbed directly [9]. Unabsorbed flavonoids that reach the colon may be subject to metabolism by bacterial enzymes, and then absorbed. Once absorbed, flavonoids reach the liver where they are metabolized to conjugated derivatives. It is known that the biological activities of flavonoid metabolites are not always the same as those of the parent compound. Two types of terpenoids are present in Ginkgo as lactones (non-saponifiable lipids present as cyclic esters): ginkgolides and the bilobalide [10].

### MATERIALS AND METHODS

The study designed to investigate the effect of *Ginkgo biloba* on the level of lipid profile so the subject used *Ginkgo biloba* 400 mg supplied from premier health products CV49up England. The lipid profile measurement

done with Reflotron plus EN device from German with Reflotron strip. The samples collected before taken the *Ginkgo biloba* and after taken *Ginkgo biloba* and lescol 30,

40 days another measured done after 18 days with lescol and without *Ginkgo biloba* the results showed in the table -1.

## RESULTS

**Table 1. The level of lipid profile and atherogenic ratio during the study**

	T.S. Cholesterol mg/dl	S. Triglycerides mg/dl	S.HDL mg/dl	S. LDL mg/dl	S.VLDL mg/dl	Atherogenic ratio
Before taken the <i>Ginkgo biloba</i>	157	210	39	76	42	1.7
After 30 days with <i>Ginkgo biloba</i> and lescol	146	200	29	95	40	3.2
After 40 days with <i>Ginkgo biloba</i> and lescol	141	174	31	75	35	2.4
After 18 days with lescol and without <i>Ginkgo biloba</i>	121	214	28	41	43	1.4

## DISCUSSION

*Ginkgo biloba* can have cardio-protective effect because it contains active substance which acts on vascular tone, collagen and plaque survivor. Recently, research has indicated that Ethanolic extract of *G. biloba* L. reduces smooth muscle contractility in small mesenteric blood vessels of rats, and improves both endothelium dependent and independent relaxation, that is, has a vasorelaxant effect. *Ginkgo* also participates in enzyme regulation and protects the blood vessels against plaque build-up. It can also function as an excellent antioxidant, due to its bioflavonoid content [11].

The bioflavonoid content of *ginkgo* enables the compound to scavenge the free radicals more effectively. The flavonoids in *ginkgo* help protect cells against free radical contact. These flavonoids have an enzyme-regulating effect also found in citrus-derived bioflavonoids with one important difference: the efficacy doses reported for *ginkgo* are much lower. In addition, these bioflavonoids provide protection to blood vessels against the damaging effect of plaque build-up. The *Ginkgo* leaf extract is also known to improve coronary blood flow through antiplatelet activity and by improving contractile functions which are due to increased release of catecholamines from endogenous liver tissue reserves by flavonoids [12].

Patel DK, et al., 2012 reported the relation between *Ginkgo biloba* extract and insulin and their study revealed that *Ginkgo biloba* extract significantly improved the insulin concentration. [13].

Insulin can influence on the level of serum triglycerides through its action on lipoprotein lipase (LPL), it's synthesized and secreted from underlying parenchymal cells, chiefly in adipose and muscle tissue, and is then trans located to the endothelial apical surface. Insulin is a main organizer of LPL activity by stimulates LPL synthesis and secretion. A study done by Knutson reported that insulin increase LPL activity by increase protein synthesis, dimerization, cellular secretion, and increased cell surface-associated mass [14], in addition to these endothelial cell-secreted factor, which stimulate the release of LPL from adipocytes, itself is dependent on insulin for its release [15]. These observations and studies explain the effect of *Ginkgo biloba* on insulin and its effect on LPL which control the level of triglycerides which clarify our results and add a new healthy rule of *Ginkgo biloba* as cardio-protective by decrease the level of cholesterol and triglycerides as shown in our results.

## CONCLUSION

*Ginkgo biloba* leaf extract revealed a hopeful herbal supplement as therapy for Hyperlipidaemia and cardiovascular disease.

## ACKNOWLEDGEMENTS

We gratefully acknowledged the funding support from Chemistry Department in College of Science- Al-Nahrain University.

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