Republic of Iraq
Ministry of Higher Education
& Scientific Research
University of Al-Qadisiyah
College of Veterinary Medicine

Effect of clove extract on serum lipids

A Graduation Project Submitted to the Department Council of the Internal and Preventive Medicine-College of Veterinary Medicine/ University of Al-Qadisiyah in a partial fulfillment of the requirements for the Degree of Bachelor of Science in Veterinary Medicine and Surgery.

By
نور حسن سميع

Supervised by

الدكتور بهاء امين عبد الحسين

2021 A.D. 1441 A.H.

بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

فَتَعَٰلَى ٱللَّهُ ٱلْمَلِكُ ٱلْحَقُّ ۗ وَلَا تَعْجَلْ بِٱلْقُرْءَانِ مِن قَبْلِ أَن يُقْضَىٰٓ إِلَيْكَ وَحْيُهُۥ ۖ وَقُل رَّبِّ زِدْنِى عِلْمًا ﴿١١٤﴾

صَدَقَ اللهُ العَظِيمُ

من سورة طه

Certificate of Supervisor

I certify that the project entitled (----------) was prepared by ---------- under my supervision at the College of Veterinary Medicine / University of Al-Qadisiyah.

Supervisor

Dept. of ----------

Coll. Of Vet.Med./ Univ. of Al-Qadisiyah.

-- / -- / 2021

Certificate of Department

We certify that ---------- has finished his/her Graduation Project entitled (----------) and candidate it for debating.

Instructor

Dr. Muthanna H. Hussain

-- / -- / 2021

Head of Dept of Int. and Prev. Med.

-- / -- / 2021

Dedication

Summary

Clove (Syzygies aromatic) has been used in folk medicine in many disorders. The present Work aimed to investigate effects of clove essential oil as eugenic and water soluble in-Gradients on mouse silences. Clove extracts were harvested and in different concentrations (0.001e1000 mg/mL) were affected to silences and also phytohemagglutinin(PHA ¼ 5 mg/mL) and lipopolysaccharide (LPS ¼ 10 mg/mL) activated silences; thenSplenocytes proliferation assayed using the MTT ([3-(4, 5-dimethylthiazole-2-yl) -2, 5-diphenyl Tetrazolium bromide]) method were done. On the culture supernatant interferon (IFN)-g,Interleukin (IL)-4, IL-10, and transforming growth factor (TGF)-b cytokines were measured.Clove ingredients (100 mg/mL and 1000 mg/mL) reduced PHA stimulated splenocytes prolifer-Ation and enhanced LPS stimulated cells expansion Treated splenocytes showed suppressionOf IFN-g release and induction of IL-4, IL-10, and TGF-b secretion (in the range of 0.1e1000 mg/mL) The results of this study suggest clove extracts could suppress the T cell cellular im-munity and enhance humoral immune responses. In clove affection cytokine pattern shiftedtoward modulatory and Th2 responses and accelerator of humoral immunity cytokines.Copyright © 2014, Food and Drug Administration, Taiwan. Published by Elsevier Taiwan

Chapter one (Introduction)

Free radical reactions have been implicated in ageing And many human diseases including atherosclerosis, Ischemic heart disease, hepatotoxicity, inflammation, Diabetes, immune suppression, neurodegenerative

Conditions and others Free radicals and other reactive Oxygen species (ROS) are formed constantly in human Body and with increased exposure to pollution, cigarette Smoke, drugs, illness, stress and even exercise can Increase free radical exposure (Rakesh et al 2010) Impairment in the oxidant/antioxidant equilibrium Provokes a situation of oxidative stress and generally Results from hyper production of ROS. Oxidative stress is Known to be a component of molecular and cellular tissue Damage mechanisms in a wide spectrum of human Diseases (Yang et al 2008) Atherosclerosis is a chronic vascular disease and aLeading cause of death in the western world. It is well Established that hyperlipidemia and ROS are major Contributors to atherogenic development. The retention of Low density lipoproteins (LDL) in the arterial wall and their Oxidation by ROS initiates a complex series of Biochemical and inflammatory reactions Oxidized LDL (ox-LDL) is internalized by macrophages through the Scavenger receptors leading to foam cell formation. Furthermore, oxidized cholesterol products present in Blood and in arterial plaques increase cholesterol Biosynthesis, affect plasma membrane structure cell Proliferation and cell death and promotesAtherosclerosis development (Livan et al 2012).Antioxidants had important role in decreasing serum Sugar, lipids and retarding atherosclerosis. The Observational epidemiological studies have suggestedthat individuals with high dietary antioxidant intake have Lower risks of coronary heart disease (CHD) which Remains the leading cause of death in most countries (Sun et al 2010) Most medicinal plants contain Flavonoids; such compounds have been associated with Several beneficial effects such as antioxidation which is Considered being a fundamental property important for Life (Halliwell and Gutteridge 1985)Spices exhibit wide range of beneficial, Pharmacological antioxidant anti-carcinogenic and anti-Inflammatory effects. Spices are

widely used as food Adjuncts and S. aromaticum constitute one of the major Spice and house-hold herbal drug (Shyamala et al 2003) S. aromaticum (L.) commonly called clove which Belongs to the family Myrtaceae, is an important aromatic Spice Clove is thought to be a native tree of Indonesia. Today, the main producers of clove essential oil are India, Indonesia, Madagascar, Madagascar, SriLanka And the south of China, although the clove tree is Cultivated in the Bangladesh and Philippines (Bhuiyan et Al., 2010) There are three essential oils available from clove Species: clove bud oil, stem oil and leaf oil. Each has Different chemical composition and flavor. Clove bud oil is the most expensive and the best quality product. TheChemical composition of the clove bud oil was obtained From steam distillation method and it was determined by Gas chromatography (GC) and gas chromatography-Mass spectroscopy (GC-MS) The findings indicated that The oils mainly had about 87% eugenol, 8.01% eugenyl Acetate and 3.56% β-carphyphyllene (Alma et al 2007) The n-hexane extract of the buds of S. aromaticum gave Orange oil with a characteristic clove odor The Sixteen Volatile compounds were determined by using GC-MS. The main components were eugenol 71.56% and Eugenol acetate 8.99% (Mahmoud et al., 2007) The essential oil obtained by hydro distillation from Fresh leaves and dry buds of Syzigium caryophyllatum Were analyzed by GC-MS Thirty eight components were Identified in the leaf oil. The main components were Eugenol (74.3%) eucalyptol (5.8%) caryophyllene(3.85%) and α-cadinol (2.43%) However, thirty one Components were identified in bud oil with the mainComponents being eugenol (49.7%) caryophyllene (18.9%) benzene,1-ethyl-3-nitro (11.1%) and benzoic Acid,3-(1-methylethyl) (8.9%) (Bhuiyan et al., 2010).The antioxidant activity of clove bud extract and its Major aroma components; eugenol and eugenyl acetate, Were comparable to that of the natural antioxidant, alpha-

Tocopherol (vitamin-E) The ethanol extract of the clove Buds showed remarkable scavenging activity (93%) as Compared with synthetic antioxidants (Mahmoud et al 2007) Also Hsiao-fen et al (2008) found that the clove Buds oil had highest total phenolic content and the Stronger DPPH radical scavenging activity than the Cinnamon leaf and thyme red. Scott et al (2009) and Adefegha and Oboh (2012) have observed that S. Elmhdwi et al 10Aromaticum possesses both anti-inflammatory and Antioxidant properties

Chapter two (Review and literatures)

Cloves are the aromatic flower buds of a tree in the family Myrtaceae, Syzygium aromaticum.They are native to the Maluku Islands (or Moluccas) in Indonesia, and are commonly used as a spice [2] Cloves are available throughout the year owing to different harvest seasons in different countries [3]

Botanical features

The clove tree is an evergreen that grows up to 8–12 metres (26–39 ft) tall, with large leaves and crimson flowers grouped in terminal clusters. The flower buds initially have a pale hue, gradually turn green then transition to a bright red when ready for harvest .Cloves are harvested at 1.5–2 centimetres (0.59–0.79 in) long and consist of a long calyx that terminates in four spreading sepals and four unopened petals that form a small central ball.

Uses…… Cloves are used in the cuisine of Asian, African, Mediterranean, and the Near and Middle East countries, lending flavor to meats, curries, and marinades, as well as fruit (such as apples, pears, and rhubarb) Cloves may be used to give aromatic and flavor qualities to hot

beverages . often combined with other ingredients such as lemon and sugar. They are a common element in spice blends including pumpkin pie spice and speculoos spices

In Mexican cuisine cloves are best known as clavos de olor and often accompany cumin and cinnamon [4] They are also used in Peruvian cuisine in a wide variety of dishes such as carapulcra and arroz con leche A major component of clove taste is imparted by the chemical eugenol[5] and the quantity of the spice required is typically small. It pairs well with cinnamon, allspice, vanilla, red wine, basil, onion, citrus peel, star anise, and peppercorns

Non-culinary uses

The spice is used in a type of cigarette called kretek in Indonesia [1] Clove cigarettes have been smoked throughout Europe, Asia and the United States Since 2009 clove cigarettes have been classified as cigars in the US [6]Because of the bioactive chemicals of clove the spice may be used as an ant repellent [7] Cloves can be used to make a fragrant pomander when combined with an orange. When given as a gift in Victorian England such a pomander indicated warmth of feeling

Potential medicinal uses and adverse effects

Long-used in traditional medicine there is evidence that clove oil containing eugenol is effective for toothache pain and other types of pain [8][9] and one review reported efficacy of eugenol combined with zinc oxide as an analgesic for alveolar osteitis [10] Studies to determine its effectiveness for fever reduction as a mosquito repellent and to prevent premature ejaculation have been inconclusive [8][9] It remains unproven whether blood sugar levels are reduced by cloves or clove oil [9] Use of clove for any medicinal purpose has not been approved by the US Food

and Drug Administration and its use may cause adverse effects if taken orally by people with liver disease blood clotting and immune system disorders or food allergies [8]

Traditional medicinal use

Cloves are used in traditional medicine as the essential oil which is used as an anodyne (analgesic) mainly for dental emergencies and other disorders [11] The essential oil is used in aromatherapy [8]

Adulteration

Clove stalks are slender stems of the inflorescence axis that show opposite decussate branching .Externally they are brownish, rough and irregularly wrinkled longitudinally with short fracture and dry, woody texture Mother cloves (anthophylli) are the ripe fruits of cloves that are ovoid brown berries unilocular and one-seeded Blown cloves are expanded flowers from which both corollae and stamens have been detached Exhausted cloves have most or all the oil removed by distillation They yield no oil and are darker in color

What is a clove medicine

Cloves are an important plant as it is widely cultivated in parts of Asia and South America People use clove oils the dried flower buds leaves and stems to make medicine

Clove is described as a pain reliever for dental pain as it is applied directly to the gums and medicinal clove extract is used to expel fever disinfectant and sterilize the stomach as it heals sores, head pain, protects from epidemics and helps digestion

Clove extract contains a chemical called eugenol that may help reduce pain, fight infections and allergies

Medication Classification: Natural Extracts

Category: Medicinal herbs

Pharmacological family:

What are the uses of cloves?

Medicines containing clove plant extract are used for the following cases:

Dental pain relief

Treating premature ejaculation

Treating pain and swelling of the mouth and throat

Cough

Diarrhea

Treat anal fissures with a clove oil cream

Reduce plaque on the teeth by using toothpastes that contain cloves

Treating dizziness and headache

Treating excessive sweating

Reducing blood sugar levels

Treating severe itching

Treat stomach gases

Facilitate the digestive process

Treating liver , intestinal and stomach disorders

What are the contraindications for using cloves?

It is forbidden to take clove medicine for people who suffer from hypersensitivity to it

What are the side effects of cloves?

The clove plant Is considered safe when taken with food but some side effects may occur but they may not always occur and some of the side effects may be rare but serious so you should consult your doctor if any of the following side effects are observed:

Sensitivity

Redness, itching, and skin irritation

What are the precautions for using cloves?

It is advised to inform the doctor of the general health condition before using clove extract for therapeutic purposes to ensure the safety of the patient in case he suffers from the following:

Heart disease

Problems with blood clotting

Perform surgeries

Pregnancy

Breast feeding

Children under 12 years old

People suffering from diabetes

What are the drug interactions for cloves?

Some medicines can cause unwanted or dangerous effects when used with clove extract so the doctor or pharmacist should be informed before starting treatment with cloves if the patient is using one of the following medicines:

Warfarin

Medicines that slow blood clotting (anticoagulant / antiplatelet drugs) including aspirin

Cladogram

Diclofenac

Ibuprofen

What are the doses of cloves and methods of use?

Clove extract is used for therapeutic purposes according to the doctor's instructions where the appropriate dose of cloves depends on several factors such as the user's age, health, and many other conditions

Chapter three (Results and Discussion)

The results pertaining to the present study Entitled are discussed as follow:

Demographic and Lifestyle Pattern Among the 500 adults surveyed a majority Of 30.4% belonged to the age group of 40To 45 years The findings of the study revealed Higher prevalence of hyperlipidemia among Adults of 40 to 45 years All the adults were Literates It is a welcome observation that about5 per cent of males and 61 per cent of females Were graduates and 25 %of males have Completed professional courses Twenty- tether Per cent of the males were engineers 41 % males and 29 % of females were

Employed either in government or private Concerns All the adults were sedentary workers It is clearly seen that 47 % of the families Were joint and 53% of them were of nuclear Type Seventy two per cent of the males and 58Per cent of the females were from high income Group (> PRs. 7500) Yoga was practiced by 45% of hauls either daily weekly once or twice and 55% of the adults were not practicing yoga Thirty- five per cent of the adults reported that They did exercise regularly from half an hour tone hour in order to keep their body fit and to Control the disease

condition All the females Were engaged in household work Seventy-four per cent of the males had the Habit of cigarette smoking Among them 55 %of the adults were regular smokers and 43Per cent of the adults developed the habit of Smoking in the past ten years Only 26% the adults did not have the habit of smoking One hundred and ten adults were not ttakinAlcohol and 60 % consumed for the past10 years and 31% consumed regularlyAnd 34 % occasionally After the onset of the disease about 34 % of adults stoppedConsuming alcohol Among the males 67 % did not have the habit of chewing neitherTobacco, pan masala nor betel leaves AmongFemales 60% had the habit of chewingAnd only 40 % did not have this habit None of the women had the habit of chewingPan masala but a majority (77 %) of womenConsumed betel leaves

---

Effect of Cloves and Turmeric on Hyperlipidemics,,Balasasi rekha Ramanujam(February 2012)

Cloves (Syzygium aromaticum) have been shown to improve insulin function in vitro but the effects on people have not been determined. The objective of this study was to determine if cloves may be important in the prevention of type 2 diabetes mellitus (DM). Thirty- six people, with type 2 DM were divided into 4 groups and given capsules containing 0, 1, 2 or 3 g of cloves/d for 30 d followed by a 10 d washout period. Since the responses to the three levels of cloves were not significantly different, the three groups were combined. Serum glucose decreased from 225 ± 67 to 150 ± 46 mg/dL, triglycerides decreased from 235 ± 63 mg/dL to 203 ± 86 mg/dL, serum total cholesterol decreased from 273 ± 78 mg/dL to 239 ± 47 mg/dL and LDL decreased from 175 ± 73 mg/dL to 145 ± 44 mg/dL after 30 d. Serum HDL was not affected by the intake of cloves. Following the 10 days of not consuming cloves, glucose, triglycerides, total and LDL cholesterol were all still significantly lower than at the onset of the study. There were no significant changes in the placebo group. In summary, consumption of capsules containing 1, 2 or 3 g of cloves/d for 30 d decreased risk factors of diabetes including glucose, triglycerides, total and LDL cholesterol with no changes in HDL concentrations. There were no significant differences among the 3 levels of cloves tested. These data suggest that intake of 1 to 3 g of cloves per day is beneficial for people with type 2 diabetes

This project was financially supported by Higher Education Commission of Pakistan.

Cloves improve glucose, cholesterol and triglycerides of people with type 2 diabetes mellitus Ramón Aznar,2020).

References

1) Adefegha S, Oboh G (2012). In vitro inhibition activity of polyphenol-rich Extracts from Syzygium aromaticum (L.) Merr. And Perry (Clove) Buds against carbohydrate hydrolyzing enzymes linked to type 2 Diabetes and Fe2+-induced lipid peroxidation in rat pancreas. Asian Pac. J. Trol. Biomed. 2(10):774-781.
2) L.M.Perry". Germplasm Resources Information Network (GRIN). Agricultural Research Service (ARS), United States Department of Agriculture (USDA). Retrieved June 9, 2011.
3) Drugs.com. Clove. Retrieved on the 25th of October, 2020, from: https://www.drugs.com/npp/clove.html
4) Ashwood ER, Tietz NW, Burtis CA 1994. Tietz Textbook
5) Of Clinical Chemistry. 2nd Edition. Philadelphia: Saunders Co.Gardner CD, Lawson LD, Block E et al. 2007. EEffec Of raw garlic vs commercial garlic supplements ooPlasma lipid concentrations in adults with moderate
6) Hypercholesterolemia: A randomized clinical trial. Arch Intern Med, 167: 346.Khan A, Safdar M, Ali Khan MM, Khattak KN, AndersonRA 2003. Cinnamon improves glucose and lipids of People with type 2 diabetes. Diabetes Care, 26 (12):3215–3218.