

## Zaitoon (*Olea europaea* L.) one of The Medicinal plants of the Holy Quran

\*Shaukat Saeed Khan

Department of Botany & Microbiology, Saifia College of Science & Education,  
Bhopal-462 001 (India)  
email : drsskhan2011@gmail.com

### Abstract

Almighty Allah has mentined a number of plants in the Holy Quran, which have been created by Him for the benefit of mankind. At one place Allah Taala says that He produces for you corn, Olives, date grapes and every kind of fruit : verily in this is a Sign for those who give thought (16:11, Al Quran).

Vernacular names- Arabic (*Zeytun*, *Zitoun*, *Situn*). Croatian (*Maslina*), Czech (*Oliva*), Danish (*Oliven*) Finnish (*Oliivi*), French (*Olive*), German (*Olbaum*, *Olive*), Hebrew (*Zayit*), Hindi (*Jatoon*), Hungarian (*Olajfa*, *Oliva*), Italian (*Oliva*, *Ulivo*), Japanese (*Oribu*), Kannada (*Aliv*, *Julipe*), Kazakh (*Zatun*, *Zaytwn*), Korean (*Ollibu*, *Ori-beu*), Maltese (*Zebbug*), Polish (*Oliwka*), Portuguese (*Oliveira*, *Azeitonia*), Romanian (*Maslin*), Russian (*Olivea*), Spanish (*Olivea*, *Aceituna*) Swedish (*Olive*). Tamil (*Caitu*, *Saidun*), Telugu (*Jaitun*), Thair (*Makok*), Turkish (*Zeytin*), Ukranian (*Oliva*, *Olyva*).

Olive tree is botanically known as *Olea europaea* L. It belongs to the family Oleaceae. *Olea europaea* is a small sized tree or shrub and occurs in the Mediterranean region from Portugal to the Levant, The Arabian Peninsula and Southern Asia as far east as China as well

as the Canary islands and Reunion. It is cultivated in many countries where it has naturalized, especially in the Mediterranean coast as well as in Argentina, Saudi Arabia, Java, Norfolk Island, California and Bermuda.

### Species of *Olea* :

*Olea* genus comprises of around 40 species. Some of these species are.

1. *Olea ambrensis* H. Perrier found in Madagascar.
2. *O. borneensis* Boerl, cultivated in Bornes & Philippines.
3. *O. cordatula* H.L.Li- found in Vietnam.
4. *O. dioica* Roxb. Found in India, Bangladesh.
5. *O. exasperata* Jacq. Grows in S. Africa.
6. *O. gamblei* C.B. clark- Occurs in Sikkim.
7. *O. javanica* (Blume) Knobl.- found in Philippines and Western Indonesia.

---

\*Retd. Professor, E-72, B.D.A. Colony, Koh-e-Fiza, Bhopal-462001 (India)

8. *O. laxiflora* H.L.Li- Cultivated in Yunnan, a Chinese province.
9. *O. neriifolia* H.L.Li- found in Hainan, a province in China.
10. *O. polygama* Wight found in India & Sri Lanka.

However, the most important species of *Olea* is *O. europaea*., which is cultivated all over the world for its edible fruits and wonderful oil which has some unique properties, not found in the oil of other plants. In the Holy Quran, Allah swears in the name of fig and olive and says, "By the fig and the olive and the mount of Sinai and this city of security (Mecca) we have in deed created man in best moulds (Surah "Teen. The fig verse or Teen 1-4).

Out of his innumerable creations The Almighty Allah has mentioned only few names of organisms in the Holy Quran. It means that, the one which has especially been named has great significance for the humanity. It is thus our duty to carry out researches pertaining to various aspects of plants, animals and minerals so that their usefulness may be brought to the fore, for our betterment.

*Botanical diagnosis* : *Olea europaea* is a small tree or shrub and rarely exceeds 8-15' in height. However, in Pisciottana a unique variety comprising of about 40,000 trees confined in the area around Pisciotta in the Campania region of Southern Italy often surpasses it. It bears silvery green leaves which are oblong and measure 4-10 cm long and 1-3 cm broad. The trunk is very characteristic which is gnarled and twisted.

The flowers are small, white, feathery

with ten cleft calyx and corolla, two stamens and a bifid stigma. The flowers are borne generally on the previous year's wood in axillary racemes.

The fruit is a small drupe 1-2.5 cm long, with thinner flesh (which is smaller in wild plants), The harvesting of olive fruits is done both in green and purple stage. The fruits are single seeded. The seed is called as a pit or rock in America and a stone in Britain.

In many cases they turn black when fully ripe.

*Habitat* :

*Olea europaea* grows best in Mediterranean climate. Greece, Italy and Spain and other countries of Mediterranean are major producers, but olives are also cultivated outside the Mediterranean region. In regions with favourable climate (eg. in California, Argentina). Some archaeological evidences show the olive trees may have been domesticated in the eastern Mediterranean region about 10,000 years ago.

*Types of olive oils* :

Based on organoleptic and analytic characteristics the olive oils may be of the following types.

(i) Virgin olive oil (VOO) : It has an impeccable taste and aroma, fruity and the acidity expressed in oleic acid may not exceed 2%.

(ii) Extra virgin olive oil (EVOO) : It is virgin oil with an impeccable taste and aroma, fruity and the acidity expressed in olive acid may not exceed 0.8%.

(iii) Ordinary virgin olive oil (OVOO): It is virgin oil with a good taste and acceptable aroma, whose acidity does not exceed 3.3%.

(iv) Refined, pure and extra light olive oil (POO) : These olive oils are obtained by refining virgin olive oils that have a high acidity level and/or organoleptic defects, which are removed after refining. Their oleic acid acidity may not exceed 0.3%.

(v) Olive oil (OO) : It is a mixture of refined olive oil and virgin olive oil fit for consumption. Its acidity may not exceed 1.0%.

(vi) Olive- Pomace oil (OPO) : It is derived from olive. It is a blend of the oil extracted from olive pomace (the pulp, skin & stones of the olive) left behind after virgin olive oil has been pressed. It requires solvents to extract the oils from the pomace. It is refined and blended with virgin olive oil. The degree of acidity should not exceed 1.0%.

#### *Chemical composition of olive oil :*

Several workers (Pasqualone *et al.*, (2005). Gunstone (2011). Servili *et al.*, (2014). & Nicola Tazzini (2015) have highlighted various aspects of chemical composition of Olive oil. A brief account is given hereunder :

From a chemical point of view, we can identify two fractions, in the olive oil depending on the behavior in the presence of heating and strong alkaline solutions (concentrated solutions of KOH or NaOH):

- the **saponifiable fraction**, which represents 98-99% of the total weight, is composed of substances that form soaps in the above conditions;
- the **unsaponifiable fraction**, which represents the remaining 1-2% of the total weight, is composed of substances

that fail to form soaps in the above conditions.

#### *Saponifiable fraction of olive oil :*

It is composed of *saturated* and *unsaturated fatty acids*, esterified almost entirely to glycerol to form triglycerides (or triacylglycerols). To a much lesser extent, diglycerides (or diacylglycerols), monoglycerides (monoacylglycerols), and free fatty acids are also found.

*Unsaturated fatty acids* make up 75 to 85% of the total *fatty acids*. *Oleic* (O) and *linoleic* (L) acids are the most abundant ones; *palmitoleic*, *eptadecenoic*, *gadoleic* and *alpha-linolenic* (Ln) acids are present in lower/trace amounts.

*Oleic acid* is the major *fatty acid* in olive oils. According to the rules laid down by the International Olive Oil Council (IOOC), its concentration must range from 55% to 83% of total *fatty acids*.

*Linoleic acid* is the most abundant *polyunsaturated fatty acid* in olive oil; its concentration must vary between 2.5% and 21% (IOOC). Because of its high degree of unsaturation, it is subject to oxidation; this means that an oil high in *linoleic acid* becomes rancid easily, and thus it may be stored for a shorter time.

In a *Mediterranean-type diet*, olive oil is the main source of fat: therefore, oleic acid, among monounsaturated fatty acids, and linoleic acid, among polyunsaturated fatty acids, are the most abundant fatty acids. Alpha-Linolenic acid must be present in very

low amount, according to the IOOC standards  $\leq 1\%$ . It is an omega-3 polyunsaturated fatty acid, which may have health benefits. However, because of its high degree of unsaturation (higher than that of linoleic acid), it is very susceptible to oxidation, and therefore it promotes rancidity of the olive oil that contains it.

*Saturated fatty acids* make up 15 to 25% of the total *fatty acids*. *Palmitic* (P) (7.5-20%) and *stearic* (S) acids (0.5-5%) are the most abundant *saturated fatty acids*; *myristic*, *heptadecanoic*, *arachidic*, *behenic* and *lignoceric* acids may be present in trace amounts.

The presence of *fatty acids* that should be absent or present in amounts different than those found is a marker of adulteration with other vegetable oils. On this regard, particular attention is paid to *myristic*, *arachidic*, *behenic*, *lignoceric*, *gadoleic* and *alpha-linolenic* acids, whose limits are set by IOOC.

The oils can be divided into two groups:

One rich in *oleic acid* and low in *palmitic* and *linoleic* acids;  
the other high in *palmitic* and *linoleic* acids and low in *oleic acid*.

*Triglycerides of olive oil* :

As previously said, *Fatty acids* in olive oil are almost entirely present as **triglycerides**. In small percentage, they are also present as diglycerides, monoglycerides, and in free form.

*Diglycerides and monoglycerides of olive oil* :

Their presence is due to an incomplete synthesis and/or a partial hydrolysis of triglycerides. The content of **diglycerides** in virgin olive oil ranges from 1% to 2.8%. 1,2-Diglycerides prevail in fresh olive oil, representing over 80% of the diglycerides.

**Monoglycerides** are present in amounts lower than diglycerides,  $< 0.25\%$ , with 1-monoglycerides far more abundant than 2-monoglycerides.

*Unsaponifiable fractions of olive oil* :

It is composed of a large number of different molecules, very important from a nutritional point of view, as they contribute significantly to the health effects of olive oil. Furthermore, they are responsible for the stability and the taste of olive oil, and are also used to detect adulteration with other vegetable oils.

This fraction includes tocopherols, sterols, *polyphenols*, pigments, hydrocarbons, aromatic and aliphatic alcohol, triterpene acids, waxes, and minor constituents.

*Polyphenols* :

They make up 18 to 37% of the unsaponifiable fraction.

They are a very heterogeneous group of molecules with nutritional and organoleptic properties (for example, oleuropein and hydroxytyrosol give oil its bitter and pungent taste).

*Hydrocarbons :*

They make up 30 to 50% of the unsaponifiable fraction.

Squalene and beta-carotene are the main molecules.

*Squalene*, isolated for the first time from shark liver, is the major constituent of the unsaponifiable fraction, and constitutes more than 90% of the hydrocarbons. Its concentration ranges from 200 to 7500 mg/kg of olive oil.

*Sterols :*

They are important *lipids* of olive oil, and are:

- linked to many **health benefits** for consumers;
- important to the quality of the oil;
- widely used for checking its genuineness.

Four classes of sterols are present in olive oil: common sterols, 4-methylsterols, triterpene alcohols, and triterpene dialcohols. Their content ranges from 1000 mg/kg, the minimum value required by the IOOC standard, to 2000 mg/kg. The lowest values are found in refined oils because of the refining processes may cause losses up to 25%.

*Common sterols or 4 $\alpha$ -desmethylsterols:*

The main molecules are **beta-sitosterol**, which makes up 75 to 90% of the total sterol,  $\Delta$ 5-avenasterol, 5 to 20%, and campesterol, 4%. Other components found in lower amounts or traces are, for example, stigmasterol, 2%, cholesterol, brassicasterol,

and ergosterol.

*4-Methylsterols :*

They are intermediates in the biosynthesis of sterols, and are present both in the free and esterified form. They are present in small amounts, much lower than those of common sterols and triterpene alcohols, varying between 50 and 360 mg/kg. The main molecules are obtusifoliol, cycloeucalenol, citrostadienol, and gramisterol.

*Triterpene alcohols or 4,4-dimethylsterols:*

They are a complex class of sterols, present both in the free and esterified form. They are found in amounts ranging from 350 to 1500 mg/kg.

The main components are **beta-amyirin**, 24-methylenecycloartanol, cycloartenol, and butyrospermol; other molecules present in lower/trace amounts are, for example, cyclosadol, cyclobranol, germanicol, and dammaradienol.

*Triterpene dialcohols:*

The main triterpene dialcohols found in olive oil are **erythrodiol and uvaol**. Erythrodiol is present both in the free and esterified form; in virgin olive oil, its level varies between 19 and 69 mg/kg, and the free form is generally lower than 50 mg/kg.

*Tocopherols :*

They make up 2 to 3% of the unsaponifiable fraction, and include vitamin E. Of the eight E-vitamins, **alpha-tocopherol**

represents about 90% of tocopherols in virgin olive oil. It is present in the free form and in very variable amount, but on average higher than 100 mg/kg of olive oil. Thanks to its *in vivo* antioxidant properties, its presence is a protective factor for health. Alpha-tocopherol concentration seems to be related to the high levels of chlorophylls and to the concomitant requirement for deactivation of singlet oxygen. Beta-tocopherol, delta-tocopherol, and gamma-tocopherol are usually present in low amounts.

#### *Pigments :*

In this group we find chlorophylls and carotenoids.

In olive oil, **chlorophylls** are present as phaeophytins, mainly phaeophytin a (*i.e.* a chlorophyll from which magnesium has been removed and substituted with two hydrogen ions), and confer the characteristic green color to olive oil. They are photosensitizer molecules that contribute to the photooxidation of olive oil itself.

Beta-carotene and lutein are the main **carotenoids** in olive oil. Several xanthophylls are also present, such as antheraxanthin, beta-cryptoxanthin, luteoxanthin, mutatoxanthin, neoxanthin, and violaxanthin.

Olive oil's color is the result of the presence of chlorophylls and *carotenoids* and of their green and yellow hues. Their presence is closely related.

#### *Triterpene acids :*

They are important components of the

olive, and are present in trace amounts in the oil.

**Oleanolic and maslinic acids** are the main triterpene acids in virgin olive oil: they are present in the olive husk, from which they are extracted in small amount during processing.

#### *Aliphatic and aromatic alcohols :*

Fatty alcohols and diterpene alcohols are the most important ones.

Aliphatic alcohols have a number of carbon atoms between 20 and 30, and are located mostly inside the olive stones, from where they are partially extracted by milling.

#### *Fatty alcohols :*

They are linear saturated alcohols with more than 16 carbon atoms.

They are found in the free and esterified form and are present, in virgin olive oil, in amount not generally higher than 250 mg/kg.

Docosanol (C22), tetracosanol (C24), hexacosanol (C26), and octacosanol (C28) are the main fatty alcohols in olive oil, with tetracosanol and hexacosanol present in larger amounts. Waxes, which are minor constituents of olive oil, are esters of fatty alcohols with *fatty acids*, mainly of *palmitic acid* and *oleic acid*. They can be used as a criterion to discriminate between different types of oils; for example, they must be present in virgin and extra virgin olive oil at levels <150 mg/kg, according to the IOOC standards.

*Diterpene alcohols :*

**Geranylgeraniol** and **phytol** are two acyclic diterpene alcohols, present in the free and esterified form. Among esters present in the wax fraction of extra virgin olive oil, oleate, eicosanoate, eicosanoate, docosanoate, and tetracosanoate have been found, mainly as phytol derivatives.

*Volatile compounds :*

More than 280 volatile compounds have been identified in olive oil, such as hydrocarbons, the most abundant fraction, alcohols, aldehydes, ketones, esters, acids, ethers and many others. However, only about 70 of them are present at levels higher than the perception threshold beyond which they may contribute to the aroma of virgin olive oil.

*Minor components :*

Phospholipids are found among the minor components of olive oil; the main ones are phosphatidylserine, phosphatidylethanolamine, phosphatidylcholine, phosphatidylinositol.

*Prophetic traditions on olives and their traditional uses :*

The following are some of the prophetic traditions on olives.

1. The Prophet (P.B.U.H.) said, Use olive oil and anoint with it, because it is from a blessed tree (Bayhaqui).

2. Prophet Muhammad (P.B.U.H.) used to praise the cure of pleurisy/pneumonia through pseudosaffron (*Flemingia grahmiana*) or *warus* and olive oil (Tirmidhi).

3. Apostle of Allah said, Take (eat)

olive oil and anoint (apply on the body). It is sacred and blessed (Ibn Maja, Tirmidhi).

4. The Prophet said, You have olive oil, take (eat) it and apply it (on body), it is useful in piles (Tirmidhi).

5. Abu Hurairah Radi Allahu anhu narrates that the Prophet (PBUH) stated, eat the olive oil, apply it (locally). Since there is cure for seventy diseases in it, one of them is leprosy (Abu Naim).

6. Saied Al-Ansari narrates that the Prophet said eat the olive oil and massage it over your bodies since it is a blessed tree (Al Tirmidhi, Ibne Maajah).

7. Khalid Bin Sa'd narrates I came to Madinah with Ghalib Bin Al Jabr, Ghalib became ill during the journey. Ibn Abi Ateeq came to see him and told a narration from Aisha that the Prophet (P.B.U.H.) told about the cure in Kalonji. We crushed a few seeds of Kalonji and mixed it with olive oil and dropped in both nostrils, after which Ghalib became healthy (Ibne Maajah, Bukhari).

8. According to Ibn Al Qayyum, olives are an exhilarant, they provide prevention against poisons, give the facial complexion glow, regulate the digestive process, expel the intestinal parasites, make the hair lustrous and minimise ageing problems. He also comments that the massage of olive oil with common salt over the gums is a remedy for several diseases of gums & teeth.

9. The chronic ulcers and boils which show difficult healing condition, are generally healed up with the use of olive oil.

10. Used as balm, it fortifies the hair, keeps the hair shiny & prevents dandruff.

11. Used as a balm it fortifies and

moisturises the skin and softening it. It also combats against acne.

12. Massaged on the body, relieves the limbs, combat against inflammation, and sooth away aches and pains from tired muscles.

13. Helps against wrinkles and delays the effects of old age.

14. Helps against strokes, heart disease, high blood pressure, diabetes.

15. Strengthens the body's immune system.

16. General consumption of olives, due to high antioxidant properties, help to combat against diseases such as cancer, asthma, osteoporosis and other ailments.

#### *Olives as food :*

In many parts of the world especially in mediterranean region the olive fruits are used both for their edible pulp (which comprises of 40% or more oil, in contrast to the kernel which contains only a small amount of oil) and as a source of olive oil. The oil has a high content of oleic and a fatty acid. Oil from olives is used as a cooking medium, in salad, dressings and as a food preservative, in some places such as the U.K. it is employed in spread. Olives are cold pressed and the first pressings which require no further treatment, are known, as 'virgin' (extra virgin olive oil is virgin oil that has a specified low acidity). The residue left after the oil extraction is known as pomace, is used in animal feed.

Both unripe (green) and mature or black olives are pickled in brine as well as in vinegar. These olives contain less oil than those used for oil extraction. It is important to note that prior to pickling, the bitter glycoxide

'Oleuropein' is neutralized with caustic soda or another lye solution.

During processing, the olives may have their pits/stones removed and sometimes replaced with pimentos or, garlic.

Olive oil is the natural oil extracted from olives, the fruit of the olive tree. About 14% of the oil is saturated fat, whereas 11% is poly unsaturated, such as Omega 6 and omega 3 & fatty acids.

#### *Olive oil benefits :*

There are innumerable uses of olive oil. Some of these are briefly dealt herewith.

*Healing after surgery :* Rubbing of olive oil on incisions help them to heal faster.

*Diaper rashes :* Olive oil is gently applied on baby's bottom to counter the irritation of diaper rash.

*Lice treatment :* Olive oil is applied on head and left for atleast 40 minutes. Extra oil is blotted and combing through hair helps in getting rid of lice.

*Skin Tumors :* The olive oil is rich in antioxidants and potassium. The rubbing of oil, helps in overcoming these ailments.

The predominant fatty acid in olive oil is a mono saturated fat, the oleic acid present to the tune of 73% of the total oil content.

Studies suggest that oleic acid reduces inflammation and may even have beneficial effects on genes linked to cancer( Menendez

*et al.*, 2006).

Apart from containing extremely useful fatty acids, it contains modest amount of vitamins E & K.

The other speciality is that the olive oil is loaded with powerful antioxidants which are biologically active and may reduce the risk of chronic diseases (Visioli *et al.*, 2018).

They also fight inflammation and protect blood cholesterol from oxidation, lower risk of cardiac diseases.

The main anti inflammatory effects are mediated by antioxidants, especially oleocanthal which has been shown to work similarly to ibuprofen, an anti-inflammatory drug.

Olive oil is antioxidant can inhibit some genes and proteins that cause inflammation.

Olive oil helps in protecting strokes which are caused by a disturbance of blood flow to the brain, either due to a blood clot or bleeding.

A study involving 841,000 people, found that olive oil was the only source of monosaturated fat associated with a reduced risk of stroke and heart disease.

In another review it is claimed that in 140,000 participants, those who consumed olive oil were at a much lower risk of stroke than those who did not.

Extra virgin olive oil lowers inflammation, protects bad "LDL" cholesterol

from oxidation improves the lining of the blood vessels and med help prevent excessive blood clotting. (Leech, 2018).

Olive oil is not associated with weight gain and obesity.

In a 30 month study involving over 7000 Spanish college students, consuming a lot of olive oil was not linked to increased weight. Additionally one three year study on 187 participants found that a diet rich in olive oil was linked to increased levels of antioxidants in blood as well as weight loss (Preety & Watson, 2014).

Olive oil fights Alzheimers disease.

It is the most common neurodegenerative condition in the world. One of the key features of this disease is the buildup of so-called beta-amyloid plaques inside brain cells. A study in Mice<sup>34</sup> showed that a substance in the olive oil can help remove these plaques.

In addition to this, a human study revealed that a mediterranean diet rich in olive oil benefitted brain function.

Olive oil reduces Type 2 Diabetes risk.

A number of studies have linked olive oil to beneficial effects on blood sugar and insulin sensitivity.

A randomized clinical trial in 418 healthy people recently confirmed the protective effects of olive oil.

In this study it was found that a

Mediterranean diet rich in olive oil reduced the risk of Type 2 diabetes by 40%.

Olive oil fights cancer.

People in Mediterranean countries have a lower risk of cancers, and many researchers are of the opinion that olive oil may be the reason (Schwingshackl and Hoffmann, 2016).

The antioxidants present in olive oil can reduce oxidative damage due to free radicals, which is believed to be a leading driver of cancer.

Many *in vitro* studies demonstrate that compounds in olive oil can fight cancer cells.

Olive oil is used in Rheumatoid Arthritis, an autoimmune disease characterized by deformed and painful joints.

It is reported that olive oil supplements improve inflammatory markers and reduce oxidative stress in individuals with rheumatoid arthritis (Leech, 2018).

A study found that olive and fish oil (a source of anti-inflammatory omega-3 fatty acids) significantly improved hand grip strength, joint pain and morning stiffness in people with rheumatoid arthritis.

Olive oil is antibacterial.

One of the harmful bacteria, *Helicobacter pylori* which lives in our stomach can cause stomach ulcers and stomach cancer. An *in vitro* study has shown that extra virgin olive oil fights 8 strains of this

bacterium, three of which are resistant to antibiotics.

*Antiviral activity :*

Salih *et al.*, (2017) have studied antiviral effects of *Olea europaea* leaves extract and Interferon -beta on gene expression of New Castle Disease virus. New castle disease virus (NDV) is a highly infectious and economically important poultry virus. For this purpose viral gene expressions of two structural proteins, matrix (M) and fusion (F) of NDV, were monitored in thickened fibroblast cells and the impact on virus replication was analysed using QRT-PCR. Additionally they analysed the virus - restriction activities of IFN- $\beta$  by assessing the expression of viral and host genes. *In vitro* analysis of the NDV replication revealed that the treatment of chicken cells with olive leaf extract significantly restricted the NDV replication as was measured by haemagglutination (HA) and titration (TCID<sub>50</sub>) assays in a preoptimized olive leaf extract mediated cytotoxicity levels (1000  $\mu$ g/ml).

*Isolation of Various compounds from olea europaea :*

Bianco *et al.*, (1998) reported the isolation of Diagalactosyldiacyl glycerols from *O. europaea*. While exploring the phenolic components of this plant (Bianco *et al.*, 2004) isolated tyrosol derivatives. In 2006, Bianco and associates reported the isolation of a new tyrosol and hydroxytyrosol derivatives.

Gariboldi and associates (1986) reported the isolation of secoiridoids from *O. europaea*. Isolation of secoiridoid glucoside from *O. europaea* was reported by Kuwajima

*et al.*, (1988).

Bianco *et al.*, (1993) reported the isolation of cornoside from *O. europaea* and its transformation, into halleridone.

While exploring the microcomponents of olive oil Bianco and co-investigators (1998) reported the presence of Glucosides of 2(2,4-dihydroxy-phenyl) ethanol.

Khayyal *et al.*, (2002) report that a specially prepared olive leaf extract (EFLA 943) was tested for its blood pressure lowering activity in rats rendered hypertensive by daily oral doses of L. Name (NG-nitro-L-arginine methyl ester 50 mg/Kg) for at least 4 weeks oral administration of the extract at different dose levels at the same time as L. Name for a period of 8 weeks showed a dose dependent prophylactic effect against the rise in blood pressure induced by L. Name, best effects being induced by a dose of 100mg/Kg of the extract.

*Cardiovascular disorders* : It has been reported that the diet of Mediterranean people is rich in olive oil, fruit, vegetables and grains and it is correlated with a lower than average risk of coronary heart disease (Kushi *et al.*, (1995). According to Visali *et al.*, (1994) the natural antioxidants, including oleuropein may play an important role in the prevention of cardiovascular diseases through a decreased formation of atherosclerotic plaques by the inhibition of LDL oxidation.

The studies of Zarzuebo *et al.*, (1991) reveal that an olive leaf extract was found to have vasodilating effects, seemingly independent of vascular endothelial integrity.

Experiments on rabbits and rats using oleuropein have been found to have hypotensive effect.

#### *Antimicrobial activities* :

Various leaf extracts have been tested for their antimicrobial activities against various pathogenic microorganisms. The studies of Qidwai and her associates (2017) reveal that all the extracts (Methanol, ethanol, acetone and aqueous) were found to be antibacterial against *Propionibacterium acnes* (MTCC 1951) and *Staphylococcus epidermidis* (MTCC 435) procured from Microbial type culture collection, Chandigarh, India. However, the degree of activity differed under different solvents.

Khan *et al.*, (2007) reports that *Olea europaea* is used traditionally as diuretic, hypotensive, emollient, laxative febrifuge, skin cleanser, cholagogue and also used for the treatment of urinary infections, gall bladder stones, bronchial asthma and diarrhoea.

I hereby acknowledge, the work carried out by various researchers, especially in the field of chemical composition & pharmacological trials of olive oil from which I have freely drawn & whose references have not been included in the present paper owing to brevity of this vast subject.

#### **References :**

1. Bianco, A., R. L. Sealzo and M.L. Scarpati (1993). Isolation of cornoside from *Olea europaea* and its transformation into halleridone, *Phytochem*, 32 : 455-457.
2. Bianco, A., R.A. Mazzei, C. Melchioni, M.L. Scarpati, A. Soriero and N. Uccella

- (1998). Microcomponents of olive oil. Part II. Diagalactosyldiacyl glycerols from *Olea europaea*, *Food. Chem.*, 62: 343.
3. Bianco, A., R. A. Mazzei, C. Melchioni, G. Romeo, M.L. Scarpati, A. Soriero and N. Uccella (1998). Microcomponents of olive oil Part III. Glucosides of 2(3,4-dihydroxyphenyl) ethanol., *Food Chem.*, 63: 461.
  4. Bianco, A., C. Melchioni, A. Ramunno, G. Romeo, and N. Uccella (2004). Phenolic components of *Olea europaea*, isolation of tyrosal derivatives., *Natural Products Research*, 18 : 29-32.
  5. Bianco, A., M.A. Chiacchio, G. Grassi, D. Iannazzo and R. Romeo (2006). Phenolic components of *Olea europaea*. Isolation of a new tyrosol and hydroxytyrosal derivatives. *Food chem.*, 95: 562-565.
  6. Gariboldi, P., G. Jommi and L. Verotta (1986). Secoiridoids from *Olea europaea*. *Phytochem*, 25 : 865-869.
  7. Gunstone F.D. Vegetable oils in food technology: composition, properties and uses. 2th Edition. Wiley J. & Sons, Inc., Publication, 2011.
  8. Huo, R., T. Du, Y. Xu, W. Xu, K. Sun *et al.*, (2015). Effects of Mediterranean style diet on glycemic control, weight loss and cardiovascular risk factors among Type 2 diabetes individuals, a meta analysis. *Eur. J. Clin. Nutr.*, 69: 1200-1208.
  9. Khan, Md. Yaseen, Siddharth Panchal, Niraj Vyas, Ameer Butani and Vimal Kumar (2007). *Olea europaea*. A Phytopharmacological Review. *Pharmacognosy Reviews* 1 (1) : 114-118.
  10. Khayyal Mohammed T., Mona A. El-Ghazaly, Datai, M. Abdallah, Noha N. Nassar, Smuel N., OK Panyi and Mathias Heinrich Kreuter (2002). Blood pressure lowering effect of an olive leaf extract (*Olea europaea* L.) in Name induced hypertension in rats. *Arzneimittelforschung.*, 52 : 797-802.
  11. Kushi, L.H. (1995). Health implication of Mediterranean diets in light of contemporary Knowledge. Meat, wine fats & oils. *Aner. J. Clin. Nulri*, 616 : 14165-14275.
  12. Kuwajima, T. Uemura, K. Takaishi, K. Inoue, and H. Inouye (1988). A secoiridoid glucoside from *Olea europaea*. *Phytochem*. 27 : 1757-1759.
  13. Leech, Joe (2018). 11 proven benefits of olive oil. *Healthline*, Sept. 14, 2018.
  14. Menendez, J.A., L. Vellon, P. Adriana and Ruth Lupa (2006). A genomic explanation connecting "Mediterranean diet" olive oil & cancer : oleic acid, the main saturated fatty acid of olive oil induces formation of inhibitory "PEA 3" *European Journal of Cancer* 42 (15): 2425-2432.
  15. Pasqualone A., Sikorska E., Gomes T. Influence of the exposure to light on extra virgin olive oil quality during storage. *Eur Food Res Technol* 2005;221:92-98. doi:10.1007/s00217-004-1126-8
  16. Preedy, Victor, R. and Ronald Ross Watson (2010). Olives and olive oil in Health and Disease prevention. Academic Press, 23 March 2010. Technology & Engineering.
  17. Qidwai Afifa, Manisha Pandey, Rajesh Kumar and Anupam Dikshit (2017). Comprehensive evaluation of pharmacological properties of *Olea europaea* L. cosmeceuticals prospects. *Clinical phytoscience and Phytotherapy*, 3: 12.
  18. Salem, Maryem Ben, Hanen Affes Kamlia

- Ksouda Zouheir Sahnoun, Khalid Mounir Zehgal and Serria Hammami (2014). Pharmacological activities of *Olea europaea* Leaves. *Journal of Food Processing and Preservation* 39 (6): 3128-3136.
19. Salih, Rajaa Hindi, Shony Mechail Odisho, Ahmed Majeed Al-Shammari, Orooba Mohammed Saeed Ibrahim (2017). Antiviral effects of *Olea europaea* leaves extract and Interferon beta on gene expression of new castle disease virus. *Adv. Anim. Vet. Sci.* 5 (11) : 436-445.
  20. Sato, Hiroyuki, Cedric Genet and Axle Strehle (2007). Antihyperglycemic activity of a TGR5 agonist isolated from *Olea europaea*. *Biochemical and Biophysical Research Communication* 362(4): 793-798.
  21. Schwin gshackl, L. and G. Hoffman (2016). Does a Mediterranean type diet reduce Cancer Risk. ? *Curr. Nutr. Rep.*, 5 : 9-17.
  22. Servili M., Sordini B., Esposito S., Urbani S., Veneziani G., Di Maio I., Selvaggini R. and Taticchi A. Biological activities of phenolic compounds of extra virgin olive oil. *Antioxidants* 2014;3:1-23. doi:[10.3390/antiox3010001](https://doi.org/10.3390/antiox3010001)
  23. Tazzini, Nicola (2015). Chemical composition of olive oil : contents in brief [www.tuscanydiet.net](http://www.tuscanydiet.net).
  24. Viscli, F., (1994). Oleoeuropein protects low density lipoprotein from oxidation., *Life Sciences*, 55 : 1965-1971.
  25. Visioli, F., M. Franco, E. Toldo, J. Luchsinger, W.C. Willet, F. B. Hu, M.A. Martinez-Gonzalez (2018). Olive oil and prevention of chronic diseases : summary of an International Conference. *Nutr. Metab. Cardiovasc. Disease. Jul.* 28(7): 649-656.
  26. Zarzuelo, A., J. Duarte, J. Jiminez, M. Gonzalez and M. P. Utrilla (1991). Vaso dilator effect of olive leaf. *Planta Med.*, 57 : 417-419.