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A Review: Therapeutic Significance of Olive *Olea europaea L.* (Oleaceae Family)

Muhammad Parvaiz, Khalid Hussain, Muhammad Shoaib, Gulzaman William, Muhammad Tufail, Zubair Hussain, Daniyal Gohar and Sahar Imtiaz

Department of Botany, University of Gujrat, Gujrat, Pakistan

Abstract: Olive (*Olea europaea L.)* is one of the oldest known cultivated plant tree species. The wild olive tree is an evergreen, prolonged species, extensive as a native plant in the Mediterranean province. This sanctified tree is an affluent source of important nutrients and bioactive of remedial and therapeutic interest. Olive fruit contains substantial concentration of fresh pulp weight of hydrophilic, lipophilic and phenolic compounds that are known to possess multiple biological activities such as antioxidant, anticarcinogenic, anti-inflammatory, antimicrobial, antihypertensive, laxative and antiplatelet. Olive oil extracted mechanically from the fruit, is also very popular for its nutritive and health-promoting potential, especially against cardiovascular disorder due to the presence of high level of monounsaturated and other valuable minor components such as phenolic, phytosterols, tocopherols, carotenoids, chlorophyll and squalene. The cultivar region of production, yield time and the processing techniques employed are some of the fact shown to influence on the composition of olive fruit and oil. This review focuses comprehensively on the therapeutic importance of the plant. A variety of factors affecting the composition of this food product and therapeutic value are also discussed.

Key words: Medicinal plants · Olive · Therapeutic importance · Pakistan

INTRODUCTION

The Olive (*Olea europaea L.)* is a small tree, which belongs to the family Oleaceae and is native to tropical and warm temperate regions of the world. The tree, well-known for its fruit, also called the olive, is commercially essential in the Mediterranean region as a most important source of olive oil [1]. The tree is usually distributed in the coastal regions of the eastern Mediterranean Basin, the neighboring coastal areas of south eastern Europe, western Asia and northern Africa as well as northern Iran at the south end of the Caspian Sea.

Although olive is now cultured in several parts of the world, the Medetarrianen region still serves as the major production area accounting for about 98% of the world's olive cultivation [2]. Earliest Greek literature reveals use of olive oil for body fitness. In the circumstance of spiritual significance, olive tree and its fruit (olives) are narrated over numerous epochs in the Bible, both in the New and Old Testaments as well as in the Quran [3]. The olive tree has an extensive history of therapeutic and nutritional values. Over the centuries, extracts from olive leaf have been used for promoting health and conservation. For instance, earliest Egyptians used the leaves to preserve Pharaohs. Similarly, they have been valued as a well-known traditional remedy to delight fever and some tropical diseases such as malaria [5]. Cost-effectively, the fruit of olive is an imperative commodity as it yields nutritious edible oil with potential remedial functions [6]. The health benefits of olive oil are mainly ascribed to the existence of high content of monounsaturated fatty acid (MUFAs) and functional bio-actives including tocopherols, carotenoids, phospholipids and phenolics, with numerous biological activities [7].

Latest advances have been made in the scientific sympathetic of how diet and explicit foods within a balanced diet promote human health and prevent chronic illnesses such as cardiovascular diseases, cancers and neurodegenerative disorders. Not astonishingly, customers are turning toward foods with remedial properties as promising dietary interventions for disease Mediterranean diet and specific foods that are essential

Corresponding Author: Muhammad Parvaiz, Department of Botany, University of Gujrat, Pakistan.

to this diet have anticipation and health maintenance. As part of this trend, awareness is grown extensively. A common aspect is the high expenditure of olives and olive oil as the primary sources of dietary fat [8].

Division, Farming and Production of Olive Oil: There are approximately 2500 identified varieties of olives, of which 250 are classified as beneficial cultivars by the global Olive Oil Council. These profitable cultivars are used for the production of either olive oil or table olives or both. The definite utilization of a given cultivar is determined by its oil content and size. Olive varieties with oil content less than (12%) such as Ascolano, Calamata and Manzanillo are almost absolutely used for table olive production, while those with higher oil yield (20%) such as Hojiblanca, Nychati Kalamon, Verdial, Gemlik, Picual and Arauco are frequently favored for the purpose of olive oil production.

Obviously, olive fruits have a bitter flavor; hence they are characteristically subjected to fermentation or treated with lye or brine to make them more appetizing. There are three significant globally used practices for preparation of olives table [9].

- Spanish-style green olives in brine
- Californian-style black olives in brine
- Greek-style black olives in brine.

Virgin olive oil is obtained slowly through physical means by mechanical or direct pressing of the olives under mild thermal conditions that do not lead to alterations in the oil composition. Virgin olive oil is not subjected to any treatment except washing, decantation, centrifugation and filtration. World olive oil production in 2009 was (2.9 million tones), of which Spain supplied (1/3) of the world's olive oil followed by Italy (1/4) and (1/5) by Greece. Greece has the highest olive oil utilization per capita globally around (23.7 liters/person/year) followed by Spain and Italy with approximately (13.62 liters) and (12.35 liters), correspondingly. On the commercial product value source, olive oil contribute (15 %) share of the global oil trade. The cost of olive oil was typically (2-5 fold), higher than that of other vegetable oils depending on the origin, category or type of the oil and the harvesting period of the olive fruits [10].

Composition of Elevated Importance of Nutrients and Functional Bioactives in Diverse Parts of Olive:

Olive Fruit: The olive fruit is an oval-shaped drupe and possesses a distinctive size of (2-3 cm width and length) and pulp per stone ratios of (3.0-6.5). The olive fruit is basically made up of 3 parts, 1: Epicarp or skin, 2: Measo-carp or pulp and 3: Endocarp or stone. The epicarp (skin) is enclosed in wax; all through the growth period of the skin color turns from light green to purple and brown or black. The measo-carp, with a soft, pulpy flesh, accounts for (84-90%) of the total fruit mass, while the hard endocarp (stone) containing the seed or kernel may differ from (13 to 30%) of fruit weight. The seed contains (2-4g oil /100g). Olive fruit weight may vary from (2-12g), although some varieties may weigh as much as (20g) [11].

Phenolic acids with fundamental frame of (C6-C1) 'hydroxybenzoic acid' such as 'vanillic acid', 'syringic acid', 'gallic acid'; (C6-C3) 'hydroxycinnamic acid' such as 'caffeic acid', 'ferulic acid' and 'sinapic acid' and flavonoids with the chemical structure of (C6-C3-C6) such as cyanidin have been investigated in olive fruit [12].

The main phenolic alcohols of olives comprise oleuropein (β-3,4-dihydroxyphenylethanol) orhydroxytyrosol and p-hydroxyphenylethanol (tyrosol). Flavonoid compounds in olive are mainly comprise of flavonol glycosides such as 'luteolin' '7-O-glucoside', 'rutin', 'apigenin 7-O-glucoside', 'anthocyanins', 'cyanidin 3-O-glucoside' and 'cyanidin 3-O-rutinoside'. Hydroxytyrosol and tyrosol are present at the highest contents of (76.73) and (19.48 mg/100g) olives, correspondingly, in assessment to the rest of the phenolic compounds [13].

Olive Oil: The oil triglycerides are mostly represented by monounsaturated (oleic acid), along with small quantity of saturates and substantial quantity of polyunsaturated mainly of linoleic acid. Several public-health based studies have exposed that the conventional "Mediterranean diet", which includes virgin olive oil as one of the most significant food ingredients, is powerfully linked with the reduced frequency of cardiovascular diseases and certain cancers. The nutritional value and health functions of virgin olive oil are ascribed to the existence of large amount of monounsaturated fatty acids (MUFAs) such as 'oleic acid' and important minor components including aliphatic and triterpenic alcohols, sterols (mainly β-sitosterol) hydrocarbons (squalene), volatile compounds, tocopherols (chiefly α-tocopherol), pigments such as chlorophylls, carotenoids, β-carotene, lutein and antioxidants. Olive oil can be categorize as a functional food that as well as having a high level of oleic acid, contains other therapeutically essential minor components with numerous biological activities [14].

Fatty Acid Composition of Olive Oil: Fatty acids present in olive oil comprise palmitic (C16:0) palmitoleic (C16:1) stearic (C18:0) oleic (C18:1) linoleic (C18:2) and linolenic (C18:3). Myristic (C14:0) margaric (C17:0) and gadoleic (C20:1) acids are originate in trace amount. Also traces of (11-cis-vaccenic and eicosenoic acids) have been detected using (C-13) Nuclear Magnetic Resonance (NMR) spectroscopic approach.

The comparatively high content of monounsaturated fatty acids (MUFAs) and less Saturated fatty acids (SFAs) and considerable (EFAs) impart olive oil a high nutritional position, while extra virgin olive oil extracted directly from olive fruit through mechanical means, has considerable antioxidant activity and therapeutic benefits due to the occurrence of an array of high-value small components such as phenolics [15].

Anti-viral, Anti-bacterial and Anti-fungal Activity: Olive leaf has been valuable for circumstances caused by or associated with a virus, retrovirus, bacterium or protozoan. Among such situation influenza, herpes 1 and 2, Candida, common cold, hepatitis B, shingles, HIV, chronic fatigue, pneumonia, tuberculosis, diarrhea,, dental, ear, blood poisoning, urinary and surgical infections; treatment of fevers, digestive and diuretic effects; liberation of low blood sugar and as a natural wide range antibiotic [16].

Antioxidant Performance: The best deliberate antioxidant phytonutrient found in olives is Oleuropein that has been shown to function as an antioxidant nutrient to decrease oxidation of cholesterol and to help guard nerve cells from oxygen-related injure.

An olive phytonutrient, Hydroxytyrosol that has been linked to cancer avoidance is also having the potential to help us prevent bone loss. The herbal medicine preparations from olives have been used in treatment of inflammatory problems, including allergy related inflammation. It is also feasible that olives may have a particular role to play as part of an overall anti-allergenic diet [17].

Anti Cancer Activity: The high content of squalene in olive oil could supply a chemo-protective effect to skin and may also provide defense against many other forms of cancer [18, 19]. Oleic acid in olives has been found to be predominantly effective against breast, colon and prostate cancer cells and could prevent up to (25%) of colon, (15%) of breast and (10%) of prostate, pancreas and endometrial cancers [20].

Hydroxytyrosol and Heart Health: Supplementary support of olive oil's effect on cardio-health was provided when the European Food Safety Authority (EFSA) approved a heart health claim for Hydroxytyrosol. The (EFSA) is a self-governing European agency, funded by the European Union resources, which offers scientific recommendation in the areas of food safety and nutrition. The findings available in the EFSA Journal support that dietary utilization of Hydroxytyrosol and related polyphenol compounds from olive fruit and olive oil offer defense to the blood lipids from oxidative injure.

The agency's scientific panel of experts based their termination on data available in one large study and two smaller scale studies, each of which showed a dose-dependent and noteworthy effect of olive oil-derived Hydroxytyrosol on the lowering of oxidized (LDL) "bad cholesterol". A smallest amount of (5mg) of Hydroxytyrosol should be contained within the food product in order to transmit the heart-health claim [21].

Metabolic Syndrome and Diabetes: Metabolic syndrome and diabetes are also risk factors for (CVD) and diet can decreased the occurrence of both. Metabolic syndrome is defined as having (3 out of 5) of the following risk factors: high blood pressure-high blood sugar- high blood lipids- low levels of (HDL) cholesterol "good cholesterol" and a large waist edge. A meta-analysis of (50) studies and (534,906) people provides considerable data of the positive effect of olive oil. The study originate diet not only condensed the rates of metabolic syndrome, it also reduced all of its individual components: waist and boundary, blood pressure, blood sugar, (HDL) cholesterol and triglycerides [22].

CONCLUSIONS

Utilization of olives or olive oil familiar as a key factor supporting the beneficial effects of the "Mediterranean diet". Olive oil had been used as a nutritious food, drug and as cosmetics for centuries by the Mediterranean inhabitants, has been a subject of much scientific interest in the last few decades, confirming its multiple biological, therapeutic and functional food applications. Presently, due to continuing scientific substantiation supported with numerous epidemiological and clinical investigational studies, the detection of olive oil as a source of food and medicine is much accredited. The most essential activities in olive oil are antioxidant, anti-microbial, anti-inflammatory and anti-cancer as manifest from a variety of studies. Olive oil is resistant to oxidation and

it has a special bitter and pungent taste. Primarily, these biological activities and individual taste are due to the presence of unique bio-active compounds in the olives, namely phenolics (Oleuropein, Hydroxytyrosol, Verbascoside and derivatives), tocopherols and carotenoids, amongst others. A number of factors, such as agronomical circumstances, climate and level of ripening, olive cultivar and type of production process have the main effects on the profile and activities of bio-active compounds in olives and olive oil. During olive oil processing, in addition to the olive oil itself, olive cake and oil mill waste water are produced, which are considered to be good sources of phenolic compounds with multiple epidemiological and therapeutic activities, thus highlighting the potential of such olive by-products for the isolation of high-value bio-actives for pharmaceutical, nutraceutical and food industries.

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