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Plant Mentioned in The Islam's Prophetic Traditions: A Review of The Scientific Evidence

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ABSTRACT

For the past thousand years, Muslim scientists from all disciplines, including philosophy, social, cultural, and historical, have discussed various diseases and their treatments based on Qur'an and Hadith. This study aimed to investigate the literature review currently available that explores the olive tree from a religious and scientific perspective. This research used qualitative methods to generate a Prophetic traditions index on medical science. The study focus on the hadith in Sahih al-Bukhari, an authentic scripture in Islam after the Qur'an, with a specific chapter on "Prophetic Medicine". All data were analyzed using Miles and Huberman approach. This study showed that identifies the relationship between religion and science in olives, with its explanation. The conclusion that there is an integration between religion and science in the olive tree is based on literature review.

Keywords: Clinical studies; hadith studies;medicinal plants;olives; traditional islamic medicine

INTRODUCTION

Traditional Islamic medicine refersto medical traditions developed in the Islamic golden age.This is because medieval Islamic societies were willing to accept cultural and religious acculturation, by incorporating various religious traditions, cultures, and languages.Although not all early scholars were Muslim or Arabic, Arabic in Islam was used to integrate all information and connect people with one language throughout the empire. Therefore, the Arabic language was used in the Islamic world due to its relationship with the Scriptures and popularity to scholars (**Falagas, Zarkadoulia, and Samonis, 2006)**.

Qur'an plants are those mentioned in the Qur'an **(Al-Hilali and Khan, 1985**), while the Prophet plants are mentioned in the Hadith of the Prophet Muhammad (PBUH) **(Mujahid, Rub, and Abdullah, 2010**). Furthermore,Prophetic traditional medicine is a written corpus describing the habits and opinions of the Prophet Muhammad (PBUH) about a healthy life. His words were collected and reviewed by Ibn Khaldun in the 14th century in thework titled "The Art and Craft of Medicine." According to the book, Muslim medics preserve classical medical knowledge and further develop possible transformation to the West through the Salerno (ca. 1000–1300 AD) and al-Andalus schools(711–1492) (**Leonti and Verpoorte, 2017**).

Religious scholars complied and supported various materials, including the statements about the origin of all diseases and their nutritional balance.Moreover, Prophet Muhammad (PBUH) taught his companions that Allah creates disease with its medicine, and body and soul caring is part of the Islamic obligation.The existing medical systems integration helps scholars to develop a scientific foundation in the context of Hadith. However, the pharmacological information is not detailed in the Hadith. This is why Prophet Muhammad's (PBUH) teachings directly support the search for new natural cures, apply, and disseminate these remedies through skilled scholars' efforts(Falagas et al. 2006). Therefore, Prophet Muhammad (PBUH), in the 7th Century AD Hadith, recommends using medicinal plants.

Based on Scriptures from various religions, the use of medicinal plants to prevent and treat health problems grew rapidly in the past.Furthermore, the application of traditional medicinal plant practices has been reviewed from a modern medicine perspective **(Hardman and Ongaro, 2020; Leonti and Verpoorte, 2017; Liquin, Metz, and Lombrozo, 2020**). Lately, natural remedies are increasingly mentioned in traditional prophetic medicine which has been investigated and shown therapeutic benefits in various disorders. Therefore, the objective of this study is to investigate the literature review currently available that explores the olive tree from a religious and scientific perspective.

Scientific hypothesis

This study had two hypotheses:

1. The olive tree with all its various products, apart from being in Islamic religious texts, is also widely studies in scientific research.
2. The slightest component contained in olives with all types of products is affecting health

MATERIAL AND METHODOLOGY

Study area

This research used qualitative methods to generate a Prophetic traditions index on medical science. Additionally, it involvestext analysis from Prophetic tradition and a hermeneutical approach to detect the relevance of the selected text to medical science. Furthermore, the study focuses only on the hadith in Sahih al-Bukhari, an authentic scripture in Islam after the Qur'an, with a specific chapter on "Prophetic Medicine".

Data collection

Olive leaves samples of Olea europaea L. were manually harvested in different geographical locations of Jaén (Spain). Six cultivars (Arbequina, Picual, and Royal, cultivated commercially for olive oil production, and three wild cultivars.

The observation was conducted in a greenhouse at the Longo nursery, Rovinj, Croatia (Latitude: 45°4′53″N, Longitude: 13°41′30″E), from September 1st until November 30th under variable ambient temperature and humidity, natural light and photoperiod. Average day/night temperatures were 24/11 °C, respectively, and relative humidity varied from 30 to 70%.

Prior to the experiment, self-rooted olive cuttings of cultivar 'Leccio del Corno' were potted in 3.6 L pots filled with Terra rossa soil (IUSS Working Group WRB 2015) mixed with additional fertilizer (Plantacote Top K 6M® 10:9:19) as 1 kg per m3 and peat.

At the beginning of the experiment, the growing substrate was characterized as pH (H2O) = 6.58, neutral reaction determined according to HRN ISO 10390:2004. On 12 months old olive plantlets the following treatments were applied: i) foliar deionized water application ii) foliar application of B solution at the beginning of the experiment (41.62 mMi.e. 450 mg B/L). The B solution was prepared by diluting 2-aminoethoxyboronic acid (FertiGlobal FOLIAREL®FLUSSIG containing 150 g of B/L) in deionized water at rate of 3 mL/L, according to the manufacturer recommendation for overall B olive requirements and as suggested by other authors. The plants were completely sprayed until the upper part of leaf blade was covered with the solution. Plants were irrigated with 200 mL of tap (Figure 1 and Figure 2).

Data analysis

All data was analyzed using **Miles and Huberman (1994)**approach, involving four phases: (i) Data reductionis primarily a screening process to sort out Prophetic traditions text related to medical science and was conducted by a group of field experts. (ii) Data displayequips Prophetic traditions with scientific medical information following the format prepared by medical experts and recognized by the Ministry of Science, Technology, and Innovation (MOSTI) through the "Malaysia Development Research Classification System". Furthermore, Prophetic traditions texts are compiled in three categories, includingthe directly connected,

clear relationship but no scientific evidence, and vague relationship. From these categories, semi-structured in-depth interviews were conducted to obtain the views of medical experts. (iii)The data verification phase is an organization of seminars to discuss the selected and categorized views obtained from interviews and workshops. (iv) The confirmed data is compiled through indexing for easy reference and access.

Statistical analysis

Two statistical analyses were used in this study. The descriptive statistics were performed in Microsoft Excel 2010. Furthermore, the data analysis for the parametric statistics which was regression analysis with the Tobit model was performed in STATA 15.1. The p-values used for this study were p <1%; 5% and 10%

RESULTS AND DISCUSSION

Olive fruit is a drupe, constituted by three distinctanatomical zones:epicarp (skin), mesocarp (pulp) and endocarp (stone) containing the seed. All three influencethe quality of the end product.

According to early scholars' experiments and observations on natural remedies, plants are an essential component of most traditional medicinal formulas. For example, Al-Razi thought about the complexity and possible side effects of the treatment and states in his book, 'If any doctor can treating using nutrition and not medicine, he has succeeded.However, if he must use drugs, it should be a simple treatment and not compound ones' **(Tibi, 2006; Tschanz, 1998**).

Attending to a patient's health is a holistic view of traditional Islamic medicine based on the surrounding environment, including lifestyle, diet, and daily activities. Furthermore, the openness to innovation and creativity helps to adopt formulations, treatments, and recipes from different beliefs and backgrounds, leading to new treatments development. Therefore, both "holistic view" and "return to nature" concepts are common in the revival period of Islamic medicine. Similar developments are seen lately in changing the view of disease and its treatment (**Inhorn and Serour, 2011**).

Some people call Arabic Islamic medicine or Arabic medicine, while others call it Islamic medicine. This is because it originated from the Islamic empire with many non-Arab Muslim doctors. However, this was inaccurate because many Christian and Jewish doctors, and scientists in the empire held top positions in the medical field **(Falagas et al., 2006**).

Natural remedies are currently used by about 80% of the world's population, especially in developing countries, for primary health care. This is due to their cultural acceptance, ease of access, and affordability (**El-Seedi et al., 2013**). Moreover, the natural products mentioned in the Qur'an and Hadith have attracted many botanists, biochemists, and pharmacognosists, resulting in further research **(Wani et al., 2011**). However, effective drugs should be easilyproduced, economically viable, exhibit favorable characteristics for absorption,

distribution, excretion, metabolism, and toxicity (ADMET), and treat the targeted disease with specificity and efficacy. Therefore, natural compounds directly function as drugs or lead compounds for derivatization and drive the discovery of new biological mechanisms, providing a better understanding of the targets and pathways involved in disease control(**Gullo et al., 2006**).

Plants mentioned in the Qur'an by Allah include onions, garlic, dates, pumpkins, figs, bananas, olives, lentils, barley, grenades, miswak tree, grapes, ginger, black mustard, bitter apple, cucumber, camel, clover, basil, camphor tree, wheat, bidara tree, and tamarisk. These plants are listed in various surahs, including Al-Baqarah, Al-An‘âm, An-Nahl, Al-Isrâ’, Al-Kahf, Al-Mu’minûn, Yâ-sîn, An-Naba’, 'Abasa, Saba’, Al-Wâqi‘ah, Yousef and At-Tin, etc. However, this study selected the twelve most common and essential plants found in the Scriptures. Additionally, there are many phenomena mentioned in the scriptures, although science has not yet revealed their secrets.For example; He released the two seas, meeting [side by side] (salt and fresh water); Between them is a barrier [so] neither of them transgresses. Besides, (Verse #. 19 - 20, Surah Ar-Rahmân) p. 593 says (And He is the One Who sends down rain from the sky for all kinds of plants to grow and produce green stalks from which we bring forth clustered grain. And from palm trees come clusters of dates hanging within reach. There are also gardens of grapevines, olives, and pomegranates, similar in shape but dissimilar in taste. Look at their fruit as it yields and ripens! Indeed, these are the signs of believers (Verse #. 99, Surah Al- An‘âm) p. 161.

According to Abu-Huraira, Prophet Muhammad (PBUH) said, “There is no disease created by Allah, except the that created with the cure", (**Al-Hilali and Khan, 1985**). Furthermore, the Prophet Muhammad (PBUH) instructed believers to seek knowledge "from the cradle to the grave" (Inhorn and Serour 2011). Therefore, curing diseases using natural products is an important aspect of religious teachings and da'wah, which encourages further development (**Ahmad et al.,2009**). This is because several clinical studies have provided evidence of the potential functions of food and plants from Traditional Prophetic Medicine, such as the miswak treeused to treat gingivitis and remove plaque (**Falagas et al., 2006**).

This study examines collective scientific evidence supporting the traditional use of food plants (olive trees) and medicines mentioned in the Qur'an and Hadith. For the past centuries, natural products have been widely used worldwide in traditional medicine, such as in Traditional Chinese Medicine (TCM), Ayurveda, Kampo, Korean Traditional Medicine, and Unani (**Yuan et al., 2016**). Furthermore, these healing systems include a type of Islamic Medicine called Prophetic Medicine, which refers to the utterances, practices, and revelations of the Prophet Muhammad (PBUH). Interestingly, many Traditional Islamic Medicine formulations described in this review are still used to treat various well-known pathological conditions, as previously described. These therapeutic activities are categorized as follows: (1) anti-cancer; (2) anti-virus; (3) anti-microbial; (4) protective against cardiovascular disease, including hypertension and atherosclerosis; (5) anti-diabetes; and (6) anti-emetic, etc (**Covas, Konstantinidou, and Fito, 2009**).

The efficacy of olive tree (Olea europaea)

From At-Tirmizi and Ibn Majah's narrations from Abu Hurairah, the Prophet said: "Eat olive oil and use it as an ointment because it is produced by a blessed tree (olive tree). Imam al-Tirmizi includes this hadith in his illicit book because it comes from Abdul Razaq from Muammar, while Abdul Razak is a mudhtarib narrator and often hesitates in his narration. However, there is a doubt in his narration because he sometimes quotes from Zaid bin Aslam, his father from Umar, and Zaid bin Aslam from Umar bin al-Khattab.

Olives are mentioned in the Qur'an and Hadith, and first in the Torah and the Bible due to their religious significance to all Prophets. Furthermore, O. europaea L. has been used over centuries as a symbol of chastity, wisdom, abundance, and health, and is widespread throughout China, Spain, Greece, and Italy **(Ariano-Sanchez et al., 2020; Gokalp, 2017; Jabeur et al., 2020; Igor Pasković, Soldo, and Talhaoui, 2019**). This is why Prophet Muhammad (PBUH) strongly advised his followers to use it as food, both for nutrition and healing. Moreover, olives are used in Greek cultureto treat fever and arthritis, and as a diuretic **(Abaza et al., 2017; Gkisakis et al., 2020; Hegazi et al., 2018; Mechri et al., 2020a**). It was also mixed with Carum carvi L. (fruit) in Canon of Medicine by Avicenna and used as a litholytic agent to treat kidney stones **(Aquino, Ponce, and Andújar, 2020; Bernardi et al., 2020; Mechri et al., 2020b; Salazar-Ordóñez, Rodríguez-Entrena, and Villanueva, 2019**).

Olives naturally contain several non-acidifying compounds such as phenols, tocopherols, sterols, pigments, and squalene which have significance in human health. Furthermore, olive oil contains unsaturated fatty acids, with oleic acidsmaking about 55-83% of the total fatty acids in olives. Most importantly, the oil contains tocopherol which consists of tocopherols a, b, c, and d. However, alpha-tocopherol is the highest among the four types making about 90% of the total tocopherol in olive oil. Therefore, it is known as vitamin E which is effective as a natural antioxidant (**Cavallo et al., 2020; Llorent-Bedmar, Cobano-Delgado,and Navarro-Granados 2020;Cosgel¸Langlois, and Miceli 2020; Mahmoud and Elkatatny, 2020**).

From several experimental studies, olive leaves have redox regulatory properties, radioprotective effects, and anti-proliferative effects on leukemia cells by inducing apoptosis. It also has cytotoxic activity against human breast cancer cells, antiviral (HIV) effect, antifungal activity, gastroprotective activity, ability to attenuate neuropathic diabetic pain, shrink gentamicin nephrotoxicity **(Annabi, Laaribi, and Gouta, 2019; Ben Hassena et al., 2020; García-Serrano et al., 2020; Pasković et al., 2019; Pošćić et al., 2018**), and anti-hypertensive effect than anti-hypertensive drugs (Captopril; clinical study) (**Collins-Kreiner, 2020; Gritsenko et al., 2020; Mechri et al., 2019; Schnittker, 2019**). Furthermore, another placebo-controlled randomized cross-trial was conducted by de Bock et al (2013) in New Zealand, where 46 participants (aged 46.4–65.5 years and overweight (BMI) 28.0–62.0 kg / m2) were randomized to receive capsules with olive leaf extract (OLE) or placebo for 12 weeks. From the results, OLE supplementation increased insulin sensitivity by 15% ($p = 0.024$) than the group receiving placebo. This was mediated through a 28% increase in the responsiveness of pancreatic β cells and fasting concentrations of interleukin-6 ($p = 0.014$), IGFBP-1 ($p = 0.024$), and IGFBP-2 ($p = 0.015$) (de Bock et al. 2013). In vivo study, olives at a dose of 200 and 400 mg/kg b.w. sustained alloxan-

induced mice for 21 days. Moreover, Cross hole test (HC), the number of holes crossed from one hole to another; open field test (OF), number of boxes passed; and free exploration (FE), the number of entries to the navel area and the time spent in it, all increased between the 14thand 21st day. Therefore, the fruit indicates a neuroprotective effect that can be used to control Alzheimer's disease (AD) (**Fernández-Escobar et al., 2016; Nasiri et al., 2019; Sharma, Anand, and Kapoor, 2017; Stateras and Moustakas, 2017**).

Morefore, these table olives presented a high total pectincontent (0.63 mg of galacturonic acid ⁄ 100 g). Pectinsconstitute one of the main matrix components of higherplant cell walls. They are considered to play important

roles in cell wall hydration, adhesion of adjacent cellsand wall plasticity during growth. Therefore, cell separation is consequent to the depolymerisation and ⁄ ordissolution of wall polymers bridging the middlelamella.

Consistency, measured bycompression test, on olivefruits before and after processing, was reported as millimetres of deformation (0.80 ± 0.17 and1.49 ± 0.07, respectively). Therefore, because of lyeaction on the epi-mesocarpic region of drupe, part of olive consistency is lost. However, fruits of this varietyare particularly solid, sothe deterioration suffered bytissues do not compromises the edibility of the finishedproduct.

These observations, also, could be relate to theperception of kinaesthetic sensations thought sensoryanalysis (hardness, fibrousness and crunchiness; Table 1). In Intosso d'Abruzzo table olives, hardness (6.60in 1–11 scale with CVr = 5.14%) and crunchiness (6.70 in 1–11 scale with CVr = 3.92%) values correspond toa medium-high level (our olives could be considered firmand crunch).

These table olives are fruits with an appreciablecontent of fibre (2.6 g ⁄ 100 g; Table 2). The dietary fibrecontent represents around 21.8% of the weight of thisprocessed olive. Table olives of Intosso d'Abruzzo cv. Arealso rich in natural antioxidants such as polyphenols (167.8 mg ⁄ 100 g; Table 2), having strong free-radicalscavenging action, and vitamins, involved in the delay of cellular aging. A recent study (Perez Jimenez et al.,2008) shows thatantioxidant-rich dietary fibre (ADF),derived from red grapes, is better at reducing risk factorsfor cardiovascular disease than other sources of dietary fibre, probably due to the combined effect of dietaryfibre and antioxidants. Table olives are rich in tocopherols (**Sakouhi et al., 2008**) and tocotrienols. As it is wellknown, these substances play a decisive role in theantioxidant mechanisms of the human body, as commented in relation to olive oil. The most abundant is atocopherol, with a concentration of around 35 mg kg)$^{-1}$.This concentration may be increased bythe addition ofsome stuffing material to the final product, as is the caseof green table olives stuffed with hazelnut, in which thea-tocopherol concentration may reach up to50 mg kg)$^{-1}$. Inprocessed green olives according toSpanish style, that a-tocopheroldecreased during processing (**Sakouhi et al., 2008**). Our table olives conserve a appreciable content of vitamin E (6.44 mg ⁄ 100 g;Table 3). The vitamin Ccontent is low (<1 mg kg)$^{-1}$;Table 3). Many green olive commercialpresentationsadd, as antioxidant,ascorbic acid, which becomes a partof their

final ingredients and increases the vitamin Ccontent of the product. This compound may beprogressively lost during shelf life, but depending on the time elapsed from packing, such table olives mayeventually represent an interesting source of vitamin C.The nutritional value of table olives with respect tovitamins is complemented by the presence of markedconcentrations of provitamin A carotenoids (Table 3).

The O. europaeafruit contains many flavonoids, especially luteolin, apigenin, quercetin-3-Routine (Routine), anthocyanins, secoiridoid, secoiridoid glycosides, and phenols such as tyrosol, hydroxytyrosol, and their derivatives **(Dorota et al., 2020; Gullon et al., 2020; Lukić et al., 2018**). However, it mainly constitutes water (60–75%) and lipids (10–25%), with relatively low sugar (2–5%), and higher oil contents. Moreover, glucose, fructose, and mannose are the main sugars in olives (**Aquino et al., 2020**), while Hydroxytyrosol is the main component of olive oil. Consequently, Hydroxytyrosol affects mammographic density in 100 women at a higher risk of breast cancer taking 25mg of the drug orally once a day for 1 year (https://clinicaltrials.gov, NCT02068092).

CONCLUSION

This study highlights the integration of traditional Islamic medicine (mentioned in the Qur'an and Hadith texts) into modern medicine or pharmaceutical principles and products. There is an integration between religionand sciencein the olive tree based on literature review.

Further research is needed to identify different levels of active compounds in plants. Therefore, several clinical studies support the use of functional foods based on Traditional Prophetic Medicine for disease prevention. Although there is a need for in-depth specialized research, authors believe that this study will promote new and more holistic medical applications. They also encourage additional studies on the plants mentioned in the hadith, especially the olive tree.

REFERENCES

Abaza, L., Taamalli, A., Arráez-Román, D., Segura-Carretero, A., Fernandez-Gutierrerez, A., Zarrouk, M., Youssef, N. B. 2017. Changes in phenolic composition in olive tree parts according to development stage. Food Research International, vol. 100, p. 454–461. https://doi.org/10.1016/j.foodres.2016.12.002

Ahmad, M., Khan,M. A., Marwat, S. K., Zafar, M. 2009. Useful medicinal flora enlisted in Holy Qur'an and Ahadith. American-Eurasian Journal of Agriculture Environmental Science, vol. 5, no. 1, p. 126–140.

Al-Hilali, M. T., Khan, M. M. 1985. Translation of the Meaning of the Noble Qur'an in the English Language. Madinah, Kingdom of Saudi Arabia: King Fahd Complex for the printing of Holy Qur'an.

Annabi, K.,Laaribi, I.,Gouta, H. 2019. Protein content, antioxidant activity, carbohydrates and photosynthesis in leaves of girdled stems of four olive cultivars. Scientia Horticulturae, vol. 256, p. 1–15. https://doi.org/10.1016/j.scienta.2019.108551

Aquino, A., Ponce, J. M., Andújar, J. M. A. 2020. Identification of olive fruit, in intensive olive orchards, by means of its morphological structure using convolutional neural networks. Computers and Electronics in Agriculture, vol. 176, p. 1–12. https://doi.org/10.1016/j.compag.2020.105616

Ariano-Sanchez, D., Muccio, C., Rosell, F., Reinhardt, S. 2020. Are trends in Olive Ridley sea turtle (Lepidochelys olivacea) nesting abundance affected by El Nino Southern Oscillation ~ (ENSO) variability? Sixteen years of monitoring on the Pacific coast of northern Central America. Global Ecology and Conservation, vol. 24, p.e01339. https://doi.org/10.1016/j.gecco.2020.e01339

Hassena, A. B., Zouari, M., Trabelsi, L., Decou,R., Amar, F. B., Chaari, A., Soua,N. et al. 2020. Potential effects of arbuscular mycorrhizal fungi in mitigating the salinity of treated wastewater in young olive plants (Olea europaea L. cv. Chetoui). Agricultural Water Management, vol,249, p.1–10. https://doi.org/10.1016/j.agwat.2020.106635

Bernardi, B., Falcone,G., Stillitano, T., Benalia, S., Bacenetti, J., de Luca, A. I. 2020. Harvesting system sustainability in Mediterranean olive cultivation: Other principal cultivar. Science of the Total Environment, vol. 766, p. 142508. https://doi.org/10.1016/j.scitotenv.2020.142508

Cavallo, C., Carlucci,D., Carfora, V., Caso, D., Cicia, G., Clodoveo, M. L., Giudice, T. D. et al. 2020. Innovation in traditional foods: A laboratory experiment on consumers' acceptance of extra-virgin olive oil extracted through ultrasounds. NJAS - Wageningen Journal of Life Sciences, vol. 92, p. 1–10. https://doi.org/10.1016/j.njas.2020.100336

Collins-Kreiner, N. 2020. Religion and tourism: A diverse and fragmented field in need of a holistic agenda. Annals of Tourism Research, vol. 82, p. 1–22. https://doi.org/10.1016/j.annals.2020.102892

Covas, M., Konstantinidou, V., Fito, M. 2009. Olive oil and cardiovascular health. Journal of Cardiovascularand Pharmacology, vol. 54, no. 6, p. 477–482.https://doi.org/10.1097/FJC.0b013e3181c5e7fd.

De Bock, K., Georgiadou, M., Schoors, S., Kuchnio, A., Wong, B. W., Cantelmo, A. R., Quaegebeur, A. et al. 2013. Role of PFKFB3-driven glycolysis in vessel sprouting. Cell, vol. 154, no. 3, p. 651-663. https://doi.org/10.1016/j.cell.2013.06.037.

Gkisakis, D. V., Volakakis,N., Kosmas, E., Kabourakis, E. M. 2020. Developing a decision support tool for evaluating the environmental performance of olive production in terms of energy use and greenhouse gas emissions. Sustainable Production and Consumption, vol. 24, no. 156–168. https://doi.org/10.1016/j.spc.2020.07.003

Dorota, D., Rupert,M., Wolosiak, R., Bzducha-Wrobel,A. Scibisz, I., Matuszewka-Janica, A. 2020. Volatiles as markers of bioactive components found in Croatian extra virgin olive oils. LWT - Food Science and Technology, vol.139, p. 1–10. https://doi.org/10.1016/j.lwt.2020.110532

Falagas, M. E., Zarkadoulia, E. A., Samonis, G. 2006. Arab science in the golden age (750 – 1258 C.E.) and today. The FASEB Journal, vol. 20, no. 10, p. 1584-1586. https://doi.org/10.1096/fj.06-0803ufm

El-Seedi, H. R., Burman, R., Mansour,A., Turki, Z., Boulos, L., Gullbo, J., Goransson, U. 2013. The traditional medical uses and cytotoxid activities of sixty-one Egyptian plants: Discovery of an active cardiac glycoside from

Urginea maritima. Journal of Ethnopharmacol, vol. 145, no. 3, p. 746–757.https://doi.org/10.1016/j.jep.2012.12.007.

Fernández-Escobar, R., Guerreiro,M., Benlloch, M., Benlloch-Gonzalez, M. 2016. Symptoms of nutrient deficiencies in young olive trees and leaf nutrient concentration at which such symptoms appear. Scientia Horticulturae, vol. 209, p. 279–285. https:// doi.org/10.1016/j.scienta.2016.07.002

García-Serrano, P., de los Santos, B., Sánchez,A. H., Romero, C., Aguado,A., Garcia-Garcia, P., Brenes, M. 2020. Progress on green table olive processing with KOH and wastewaters reuse for agricultural purposes. Science of the Total Environment, vol. 746, p. 1–6. https://doi.org/10.1016/j.scitotenv.2020.141150

Gokalp, F. 2017. An investigation of the olive phenols activity as a natural medicine. Journal of Food and Drug Analysis, vol. 26, no. 2, p.657-661. http://dx.doi.org/10.1016/j.jfda.2017.07.003

Gritsenko, V., Kogan,M.,Konstantinov, V., Marinova, T., Reznik, A., Isralowitz, R. 2020. Religion in Russia: Its impact on university student medical cannabis attitudes and beliefs. Complementary Therapies in Medicine, vol. 54, p. 1–5. https://doi.org/10.1016/j.ctim.2020.102546

Gullo, V. P., McAlpine, J., Lam,K. S., Baker, D. 2006. Drug discovery from natural products. Journal of Industrial Microbiology and Biotechnology, vol. 33, no. 7, p. 523–531. https://doi.org/10.1007/s10295-006-0107-2

Gullon, P., Gullon, B., Astray, G., Carpena, M., Fraga-Corral, M., Prieto, M. A., Simal-Gandara, J. 2020. Valorization of by-products from olive oil industry and added-value applications for innovative functional foods. Food Research International, vol. 137, no. 1–17. https://doi.org/10.1016/j.foodres.2020.109683

Hardman, D., Ongaro, G. 2020. Subjunctive medicine: A manifesto. Social Science & Medicine, vol. 256, p. 1–7. https://doi.org/10.1016/j.socscimed.2020.113039

Hegazi, E. S., El-Motaium,R. A., Yehia, T. A., Hashim, M. E. 2018. Effect of foliar boron application on boron, chlorophyll, phenol, sugars and hormones concentration of olive (Olea europaea L.) buds, leaves, and fruits. Journal of Plant Nutrition, vol. 41, no. 6, p. 749–765. https://doi.org/10.1080/01904167.2018.1425438

Inhorn, M. C., Serour, G. I. 2011. Islam, medicine, and Arab-Muslim refugee health in America after 9/11. Lancet, vol. 378, no. 9798, p. 935–943.https://doi.org/10.1016/S0140-6736(11)61041-6.

IUSS Working Group WRB. 2015. World reference base for soil resources 2014, update 2015: International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. Retrieved from http://www.fao.org/3/i3794en/I3794en.pdf

Jabeur, H., Marrakchi, F., Drira,M., Ghodhbani, I., Bouaziz, M. 2020. 2-glyceryl monopalmitate in virgin and pomace olive oil during refining processes. Food Bioscience, vol. 38, p. 1–10. https://doi.org/10.1016/j.fbio.2020.100774

Leonti, M., Verpoorte, R. 2017. Traditional mediterranian and european herbal medicines. Journal of Ethnopharmacology, vol.1999, p.161–167.https://doi.org/10.1016/j.jep.2017.01.052

Lioupi, A., Nenadis, N., Theodoridis, G. 2020. Virgin olive oil metabolomics: A review. Journal of Chromatography B, vol. 1150, p. 1-19. https://doi.org/10.1016/j.jchromb.2020.122161

Lanza, B., Di Serio, MG., Iannucci E. 2010. Nutritional, textural and sensorial characterisation of Italian tableolives (Olea europaea L. cv. 'Intosso d'Abruzzo'). International Journal of Food Science & Technology, vol.45, p. 67-74. doi:10.1111/j.13652621.2009.02104.x

Liquin, E. G., Metz, S. E., Lombrozo, T. 2020. Science demands explanation, religion tolerates mystery. Cognition, vol. 204, p. 1–17. https://doi.org/10.1016/j.cognition.2020.104398

Llorent-Bedmar, V., Cobano-Delgado, P. V., Navarro-Granados, M. 2020. Islamic religion teacher training in Spain: Implications for preventing islamic-inspired violent radicalism. Teaching and Teacher Education, vol. 95, p. 1–12. https://doi.org/10.1016/j.tate.2020.103138

Lukić, I., Krapac,M., Horvat, I., Godena, S., Kosic, U., Bubola, K. B. 2018. Three-factor approach for balancing the concentration of phenols and volatiles in virgin olive oil from a late-ripening olive cultivar. LWT-Food Science and Technology, vol. 87, p. 194–202. https://doi. org/10.1016/j.lwt.2017.08.082

Cosgel, M. M., Langlois, R. N. Miceli, T. J. 2020. Identity, religion, and the state: The origin of theocracy. Journal of Economic Behavior and Organization, vol. 179, p. 608–622. https://doi.org/10.1016/j.jebo.2020.09.026

Mahmoud, A. A., Elkatatny, S. 2020. Improved durability of Saudi Class G oil-well cement sheath in CO2 rich environments using olive waste. Construction and Building Materials, vol. 262, p. 1–11. https://doi.org/10.1016/j.conbuildmat.2020.120623

Mechri, B., Tekaya, M., Hammami, M., Chehab, H. 2020a. Effects of drought stress on phenolic accumulation in greenhouse-grown olive trees (Olea europaea). Biochemical Systematics and Ecology, vol. 92, p. 1–7. https://doi.org/10.1016/j.bse.2020.104112

Mechri, B., Tekaya, M., Attia, F., Hamami, M., Chehab, H. 2020b. Drought stress improved the capacity of Rhizophagus irregularis for inducing the accumulation of oleuropein and mannitol in olive (Olea europaea) roots. Plant Physiology and Biochemistry, vol. 156, p. 178–191. https://doi.org/10.1016/j.plaphy.2020.09.011

Mechri, M., Tekaya, M., Hammami, M., Chehab, H. 2019. Root verbascoside and oleuropein are potential indicators of drought resistance in olive trees (Olea europaea L.). Plant Physiology and Biochemistry, vol. 141, p. 407–414. https://doi.org/10.1016/j.plaphy.2019.06.024

Miles, M B., Huberman, A. M. 1994. An Expanded Sourcebook: Qualitative Data Analysis. London: Sage Publications.

Mujahid, A. M., Rub, J. A., Abdullah, A. R. 2010. Healing with the medicine of the Prophet "Peace be upon him". Fordham University, United States of America.

Nasiri, M., Abbasi,M., Khosroabadi, Z. Y., Saghafi, H., Hamzeei, F., Amiri, M. H., Yusefi, H. 2019. Short-term effects of massage with olive oil on the severity of uremic restless legs syndrome: A double-blind placebo-controlled trial. Complementary Therapies in Medicine, vol. 44, p. 261–268. https://doi.org/10.1016/j.ctim.2019.05.009

Pasković, I., Ćustić,M. H., Pecina, M., Bronic, J., Ban, D., Radic, T., Poscic,F. et al. 2019. Manganese soil and foliar fertilization of olive plantlets: The effect on leaf mineral and phenolic content and root mycorrhizal

colonization. Journal of Science Food and Agriculture, vol. 99, no. 1, p. 360–367. https://doi.org/10.1002/jsfa.9196

Pasković, I.,Soldo, B., Talhaoui, N., Palcic, I., Brkljaca,M., Koprivnjak, O., Germek, V. M. et al. 2019. Boron foliar application enhances oleuropein level and modulates volatile compound composition in olive leaves. Scientia Horticulturae, vol. 257, p. 1–9. https://doi.org/10.1016/j.scienta.2019.108688

Pošćić, F., Runjić, M., Špika, M. J., Mikac, N., Rengel, Z., Romic, M., Urlic, B.et al. 2018. Nutrient deficiencies in olives grown on typical Mediterranean soils (Terra rossa, Rendzina, Lithosol). Archieves of Agronomy and Soil Science, vol. 13, no. 64, p. 1777–1790. https://doi.org/10.1080/ 03650340.2018.1457785

Salazar-Ordóñez, M., Rodríguez-Entrena,M., Villanueva, J. A. 2019. Exploring the commodification of biodiversity using olive oil producers' willingness to accept. Land Use Policy, In Press, p. 1–11. https://doi.org/10.1016/j.landusepol.2019.104348

Schnittker, J. 2019. Religion, social integration, and depression in Europe: Evidence from the European Social Survey. Social Science & Medicine, vol.267, p. 1–8. https://doi.org/10.1016/j.socscimed.2019.112376

Sharma, E., Anand, G., Kapoor, R. 2017. Terpenoids in plant and arbuscular mycorrhizareinforced defence against herbivorous insects. Annals of Botony, vol.5, no. 119, p. 791–801. https://doi.org/10.1093/aob/mcw263

Stateras, D. C., Moustakas, N. K. 2017. Seasonal changes of macro- and micro-nutrients concentration in olive leaves". Journal of Plant and Nutrition, vol.2, no. 41, p. 1–11. https://doi.org/10.1080/01904167.2017.1383421

Tibi, S. 2006. Al-Razi and Islamic medicine in the 9th century. Journal of the Royal Society of Medicine, vol. 99, no. 4, p. 206–208.https://doi.org/10.1177/014107680609900425

Tschanz. 1998. The mother earth living newsletter. Retrieved from http://www.motherearthliving.com/health-and-wellness/ history-of-islamic-medicine-zm0z98ndzhou

Wani, B. A., Wani, F. M., Khan, A., Bodh, R. H. 2011. Some herbs mentioned in the Holy Quran and hadith and their medicinal importance in contemporary times. Journal of Pharmacy Research, vol. 4, no. 11,p. 3888–3891.

Yuan, H., Ma,Q., Ye, L., Piao, G. 2016. The traditional medicine and modern medicine from natural products. Molecules, vol.21, p. 559.https://doi.org/10.3390/molecules21050559.

Conflict of Interest:

The authors declare no conflict of interest.

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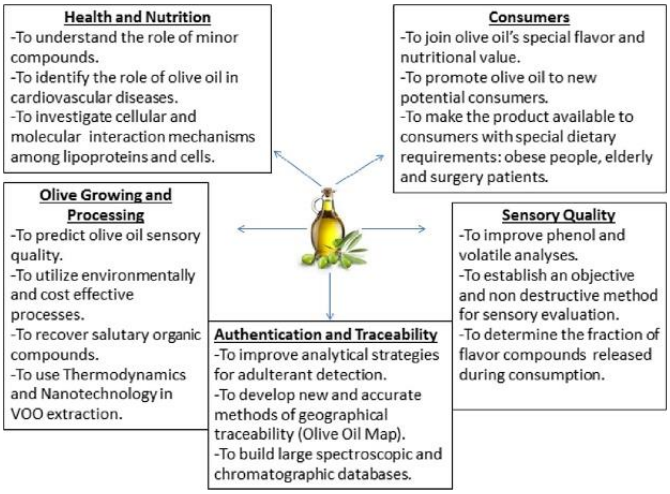

Figure1 The five main pillars for olive oil scientific research. **(**Reproduced from**Artemis Lioupi et al. 2020**)

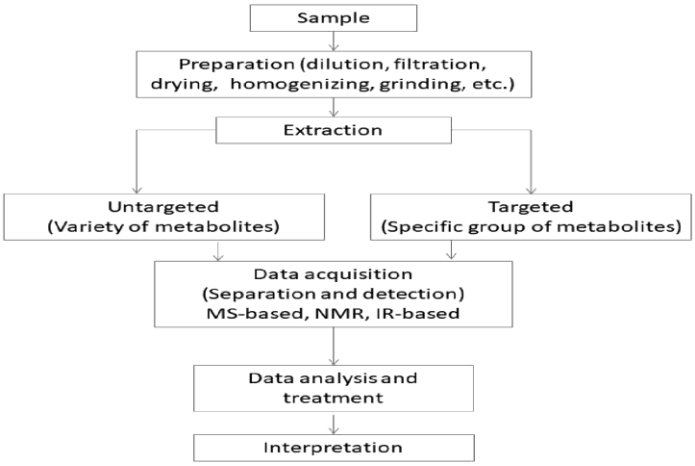

Figure2 Schematic presentation of the food metabolomics process. (Reproduce from **Artemis Lioupi et al., 2020**)

Table 1 Sensory profile of Intosso d'Abruzzo table olives

Atributes	**Median CVr**	**%**
Negative sensations		
Abnormal		
Fermentation	1.00	0
Cooking effect	1.00	0
Rancid	1.00	0
Musty	1.00	0
Gustatory sensations		
Salty	4.80	16.72
Bitter	3.70	8.76
Acid	2.90	18.62
Kinaesthetic sensations		
Hardness	6.60	5.14
Fibrousness	4.20	12.49
Crunchiness	6.70	3.92

The table is derived from Barbara Lanza et al (2010)

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Table 2 Nutritional characteristics of Intosso d'Abruzzo table olives

	Quantity for 100 g of pulp	Quantity for serving size
Energy (kcal)	190	74
Energy (kJ)	785	305
Edible part (% of olive pulp)		84.94
Moisture (%)		74.3
Ash (g)	4.4	1.7
Carbohydrates (g)	2.8	1.1
Fibre (g)	2.6	1.0
Proteins (g)	1.0	0.4
Fats (g)	17.5	6.9
Saturated fatty acids (g)	2.7	1.1
Monounsaturated fatty acids (g)	13.6	5.3
Polyunsaturated fatty acids (g)	1.2	0.5
Trans fatty acids (g)	0.01	tr
Cholesterol (mg)	0.02	tr
MUFA／SFA		5.04
PUFA／SFA		0.45
(PUFA+MUFA)／(SFA+TFA)		5.48
Polyphenols (mg of caffeic acid)167.8		65.3
Minerals		
Sodium (g)	1.3	0.50
Calcium (mg)	33.6	13.0

The table is derived from Barbara Lanza et al.(2010)

Table 3 Vitamin pattern of Intossod'Abruzzo table olives

Vitamin	**Quantity**
Vitamin C (mg kg^{-1})	< 1
Provitamin A carotenoids	
β-criptoxantin (mg kg^{-1})	< 0.1
13-cis-b-carotene (mg kg^{-1})	0.1
All-trans-a-carotene (mg kg^{-1})	< 0.1
All-trans-b-carotene (mg kg^{-1})	0.7
9-cis-β-carotene (mg kg^{-1})	< 0.1
Retinol equivalents (lg／100 g)	12
Vitamin E (mg／100 g)	6.44

The data are expressed as mean and the coefficient of variation was <5%.Source: The table is derived from Barbara Lanza et al.(2010)

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