

Medicinal uses of the olive tree and wild olive tree in al-Andalus (9th-15th centuries) (II): dermatology, dentistry, ophthalmology

Usos medicinales del olivo y el acebuche en al-Andalus (ss. IX-XV) (II): dermatología, odontología, oftalmología

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Recibido: 30/07/2025

Aprobado: 16/07/2026

Publicado: 11/08/2026

ABSTRACT

Talking about the history of health, hygiene and disease in al-Andalus necessarily implies talking about the remedies used by its populations to treat their ailments and diseases. As a case study, the present research analyzes the knowledge collected in Andalus texts of Galenic-Islamic medicine and pharmacology about the potential and therapeutic uses of *Olea europaea* L. in the fields of dermatology, dentistry and ophthalmology. The results include the ailments and diseases treated, the therapeutic uses, the parts of the plant used in each treatment, its preparations and forms of administration, the Andalus authors who provide this information, and the Greek and eastern Arabic sources they cite. These data are evaluated in the light of current scientific knowledge on the therapeutic potential of *Olea europaea* L. as well as in the light of ethnobotanical evidence of its uses in the Mediterranean basin over the centuries.

Keywords: *Olea europaea* L., medicine in al-Andalus, phytotherapy, historical ethnomedicine, historical ethnopharmacology.

RESUMEN

Hablar de la historia de la salud, la higiene y la enfermedad en al-Andalus implica necesariamente hablar de los remedios utilizados por sus poblaciones para tratar sus dolencias y enfermedades. Como caso de estudio, la presente investigación analiza el conocimiento recogido en los textos andalusíes de medicina y farmacología galénicas acerca del potencial y usos terapéuticos de *Olea europaea* L. en el campo de la dermatología, la odontología y la oftalmología. Los resultados incluyen las dolencias y enfermedades tratadas, los usos terapéuticos, las partes de la planta empleadas en cada tratamiento, sus preparados y formas de administración, los autores andalusíes que ofrecen estas informaciones, y las fuentes griegas y árabes orientales que estos citan. Estos datos son evaluados a la luz del actual conocimiento científico sobre el potencial terapéutico de *Olea europaea* L. así como a la luz de las evidencias etnobotánicas de sus usos en la cuenca del Mediterráneo a lo largo de los siglos.

Palabras clave: *Olea europaea* L., medicina en al-Andalus, fitoterapia, etnomedicina histórica, etnofarmacología histórica.

1. INTRODUCTION

Talking about the history of health, hygiene and disease of the populations of al-Andalus necessarily implies talking about the plant species used by them to treat their ailments and illnesses. We can assume in general

terms that these species were used in the Andalus context in two different fields at the same time: in the field of Galenic-Islamic medicine and in that of traditional folk medicine. It is undeniable the great value of the data that archaeology and other related disciplines can provide in the future to the

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Cómo citar: Indalecio Lozano Cámara, María Ángeles Navarro García (2026): Medicinal uses of the olive tree and wild olive tree in al-Andalus (9th-15th centuries) (ii): dermatology, dentistry, ophthalmology. *Arqueología y Territorio Medieval*, 33, e9649. <https://doi.org/10.17561/aytm.v33.9649>



knowledge of the therapeutic use of plants in the framework of traditional medicine in al-Andalus, while the Andalusí texts of medical-pharmacological content continue to be the main source of information in the case of Galenic-Islamic medicine. Traditionally, these texts have been the object of an essentially philological interest, thanks to which we now have a significant corpus of editions and translations that usually include also historiographical data. However, there are still very few studies that deal with the analysis *per se* of the medical-pharmacological information recorded in the Andalusí sources.

Beyond the philological approach, the present research proposes as a case study the analysis of the knowledge reached in al-Andalus in the field of Galenic-Islamic medicine and pharmacology about the potential and therapeutic uses of *Olea europaea* L.³ in dermatology, dentistry and ophthalmology. The information contained in the Andalusí sources is analyzed in the light of current scientific knowledge about its potential and uses in these fields of medicine. The objective is to estimate the degree of development of knowledge about *Olea europaea* L. in Andalusí galenic medicine in relation to the current scientific knowledge about this plant species. In other words, the aim is to establish in each specific case whether the potential effectiveness of the therapeutic treatments with *Olea europaea* L. described in the Andalusí texts is 'validated' by the current scientific literature.

On the other hand, and despite the lack of definitive evidence in this regard, we have information that allows us to strongly hypothesize that *Olea europaea* L. was used as a medicinal plant in al-Andalus not only in the context of galenic medicine but also in the context of traditional medicine. In this sense, the current ethnomedicinal uses of *Olea europaea* L. in the Mediterranean basin can be interpreted as a reflection and

an indication that the uses recorded in the Andalusí sources have survived throughout the centuries and to this day in the Mediterranean region.

Although the origins of *Olea europaea* L. are still a complex issue subject to discussion, it is generally accepted that the wild olive tree has coexisted with the human populations for at least twelve millennia, while the existence of the cultivated olive tree — resulting from the domestication of the former— dates back to about 6.000 years ago. Since then, and up to the present day, *Olea europaea* L. has coexisted with the civilizations developed in the Mediterranean basin (DE LA TORRE ROBLES, 2015: 3 ff.; UYLAŞER, YILDIZ, 2014: 1092-1093; EL-KHOLY *et alii*, 2012; BRUN, 2011-2012; KAPELLAKIS, TSAGARAKIS, CROWTHER, 2008; MATAIX, BARBANCHO, 2007; RODRÍGUEZ-ARIZA, MONTES, 2007). In the absence of more precise evidence, we can assume that the history of *Olea europaea* L. from its origins to the present day has been simultaneously that of —among others— its uses as food and medicine. An important chapter of this long and uninterrupted history corresponds to the Arab-Islamicate civilization in general and the Andalusí one in particular. Reproducing a common but no less true *cliché*, we will say that al-Andalus occupied from the 8th to the 15th century a preeminent place as a neuralgic center of all kinds of exchanges in the Mediterranean basin, being a melting pot of different cultural traditions and scientific knowledge, as it happened in the case of *Olea europaea* L. (BOLENS, 1996). Among the works published so far on different aspects of the history of the olive tree and wild olive tree in al-Andalus, some allude in passing to its therapeutic uses (GARCÍA-SÁNCHEZ, CARABAZA BRAVO, HERNÁNDEZ-BERMEJO, 2021: 349 ff., 356-358; CARABAZA *et alii*, 2004: 294, 303 ff.; PÉREZ, 1999). We also have a monographic publication on the subject (LOZANO, NAVARRO, 2023).

³ Six subspecies of *Olea europaea* are recognized, including *Olea europaea* subsp. *europaea*, typical of the Mediterranean region and of which two varieties are recognized: the type of the species, that is, the var. *europaea* (the olive tree) and the *oleaster* variant (the wild olive tree) (GARCÍA-SÁNCHEZ, CARABAZA BRAVO, HERNÁNDEZ-BERMEJO, 2021: 342).

2. MATERIAL AND METHOD

A review of a large part of the works of the Andalusí naturalists that have reached us has been carried out. It is a textual corpus composed of more than forty sources, whose chronological coverage extends from the 9th century to the 15th century. This corpus includes texts of different typology susceptible—in principle—of containing relevant information on the subject that concerns us, especially medical-pharmacological treatises, as well as calendars, works on agronomy, botany and bromatology.

The method used to obtain, classify and analyze the data used as a basis for this research was as follows: establishment of the textual corpus of the study; identification and choice of search terms in the sources;

identification of the therapeutic uses cited in these sources; systematic recording of the uses in a table (Table 1. *Results*) in which the parts of the plant used in each treatment, the preparations and forms of administration, and the pre-Islamic and eastern Arabic sources cited by the Andalusí naturalists are listed. These data have been contrasted with the information collected in scientific publications currently investigating the medicinal uses of *Olea europaea* L. Likewise, the data recorded in the Andalusí sources have been compared with ethnobotanical evidence about traditional uses of this plant species in the Mediterranean basin and in other regions of the Islamic world. To locate the scientific publications that have been used to carry out both comparisons, searches were carried out in Google Scholar, PubMed, Web of Science, Scopus and ScienceDirect.

3. RESULTS⁴

Table 1. *Results.*

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
DERMATOLOGY				
Erysipelas	Leaves of wild olive tree	Crushed and applied hot in a poultice	IB: I, 483 ⁶ ; T: 205; IW: I, 107; GF: 156a; ID: I, 138	D
Anti-dandruff	Green wood	Moisture that oozes out when burned, smeared	IB: I, 484; IW: I, 105; T: 205; GF: 156b; ID: I, 137	D
	Fruit	Applied in poultice	IB: I, 484; IW: I, 105; GF: 156b	D
	Fruit of wild olive tree	Spreadable oil	IB: I, 485; IW: I, 108; GF: 157b	D
	Unripe fruit	Crushed and applied as a poultice	ID: I, 137	

(continued)

⁴ Abbreviations and chronology of sources cited in the table: AJ = Abū I-Jayr (11th c.); D = Dioscorides (1st c.); F = *al-Filāḥa al-nabaṭiyya* (10th c.); G = Galen (2nd c.); GF = al-Gāfiqī (12th c.); IB = Ibn al-Bayṭār (13th c.); IBU = Ibn Buklārīš (11th-12th c.); ID = al-Idrīsī (12th c.); IH = Ibn Ḥabīb (9th c.); II = Ishāq Ibn ʿImrān (9th-10th c.); IJT = Ibn al-Jaṭīb (14th c.); IS = Ibn Sīnā (10th-11th c.); IW = Ibn Wāfid (11th c.); IZ = Ibn Zuhr (12th c.); P = Paul of Aegina (7th c.); T = al-Tignarī (11th c.); TB = al-Ṭabarī (9th c.); TY = *al-Taʿyribatayn* (12th c.).

⁵ When the variety of *Olea europaea* used in the different treatments is not explicitly mentioned, it should be understood that it is the olive tree. Otherwise, the wild olive tree is explicitly mentioned.

⁶ The references to Ibn al-Bayṭār collected in this table are taken from the Arabic edition published in 1992, not from the French translation by Leclerc (IBN AL-BAYṬĀR, 1987).

Table 1. *Results. (continued)*

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
<i>Al-namla</i> ⁷ (prevents it from spreading through the body)	Leaves of wild olive tree	Crushed and applied as a poultice	IB: I, p. 483; T: 205; IW: I, 107; GF: 156a; ID: I, 138	D
Crusts of the pustules of the <i>'btrāqš/ysrāqs</i> ⁸ , pluck out the	Ripe black olives Leaves of wild olive tree	Burned and applied in poultice Crushed and applied as a poultice	IB: I, 484; GF: 157a IB: I, 483; GF: 156a	D D
Pustules, cures	Green wood	Moisture that oozes out when burning, smeared	ID: I, 137	D
Trichological treatments				
Hair tonic	Fruit	Sweet oil smeared on the hair (boil sorrel in water until it cracks a little, filter it and add a similar amount of sweet oil, boiling it again until the water is consumed)	IZ (transl.): 139-140	
Weak hair, prevents hair loss and makes it thicker	Fruit of wild olive tree	Oil smeared	IB: I, 485; IW: I, 108; GF: 157b; ID: I, 139	D / G (ID)
Hair, slows graying and blackens the hair	Fruit of wild olive tree	Oil smeared daily	IB: I, 485; IW: I, 108; GF: 157b; ID: I, 139	D / G (ID)
Burns, prevents them from blistering	Water olives or green olives, which do not yield oil and can be preserved in salt and water or in salt and vinegar	Crushed and applied as a poultice	IB: I, 484; IW: I, 105; GF: 156b; ID: I, 137-138	D

⁷Itchy skin disease (DICCIONARIO TERMINOLÓGICO, 1980: 504, s.v. hormiga). It should be noted that this Arabic term also has the general meaning of 'pustules' (CORRIENTE, 1977: 785, s.v. naml), and we cannot rule out that the sources refer to these pustules.

⁸It is not possible to know to which specific disease these terms —the correct vocalization of which we ignore— refer. Ibn al-Baytār explains that this *'btrāqš* is also known by the name *al-nār al-fārisiyya*. According to DOZY, 1981: II, 743, s.v. nār, the term *nār fārisī* designates anthrax or carbuncle, a skin disease characterized by the accumulation of boils (DICCIONARIO TERMINOLÓGICO, 1980: 68, s.v. anthrax, 169, s.v. carbunco o carbúnculo). This is consistent with the fact that DIOSCÓRIDES, 2002: 105, says: "they tear off the crust of carbuncles" (own translation). See also IBN WĀFID, 1995: I, 105, n. 5.4. However, DOZY, 1981: II, 743, s.v. *nār* indicates that the term *al-nār al-fārisiyya* means 'erysipelas'. On the other hand —and for further confusion— it should be noted that the editor of IBN AL-JAṬĪB, 1972: 81, s.v. *nār fārisiyya*, translates this term as 'fuego persa o de San Antón', which, according to the DRAE, s.v. fuego périco, is a now disused Spanish medical term designating shingles.

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
Scabicide	Green wood	Moisture that oozes out when burning, smeared	IB: I, 484; T: 205; IW: I, 105; GF: 156a;	D
	Fruit of wild olive tree	Oil	IB: I, 485; IW: I, 108; GF: 157b	D
	Gum resin of wild olive tree ⁹		T: 205; IW: I, 108; GF: 156b	D
Nails, removes white spots on the nails	Fruit	Inner part of the olive pit mixed with fat and flour	IB: I, 484; IW: I, 105-106; GF: 156b	D
	Green wood + fruit	Moisture oozing from green wood when burned, mixed with the fruit	ID: I, 137	
Whitlow	Leaves of wild olive tree	Crushed and applied as a poultice	IB: I, 483; T: 205; IW: I, 107; GF: 156a; ID: I, 138	D
Eczema ¹⁰	Green wood	Moisture oozing out of it when it burns, smeared	IB: I, 484; IW: I, 105; T: 205; GF: 156b	D
	Gum resin of wild olive tree or olive tree	Dissolved in vinegar, or not, and smeared	T: 105; IW: I, 108; GF: 156b; AJ: II, 510 ¹¹	D
Healing for wounds and fistulas	Fruit	Olive mill wastewater boiled in a copper vessel until it acquires the texture of honey or burns, mixed with honey, or wine devoid of any additives, or mulsum wine, or vinegar, and applied as an ointment (this preparation is more effective when aged)	IB: I, 487; IW: I, 107; GF: 158b	D
	Fruit	Olive mill wastewater	IB: I, p. 487; GF: 158a	G
	Gum resin of wild olive tree or olive tree	Smeared in the form of ointment	AJ: II, 510	

(continued)

⁹ DIOSCÓRIDES, 2002: 106, attributes this and other scabicial properties to “the tear of the Ethiopian olive tree”, that is, to the gum resin of the wild olive tree. However, in this and other cases, the Andalusí sources are neither unanimous nor, sometimes, clear, in indicating whether they refer to the gum resin of the olive tree and/or of the wild olive tree.

¹⁰ In Arabic: *qūbā'* (pl., *qawābī*). This term is the subject of different translations: ‘impetigo’, ‘eczema’, ‘shingles’ (CORTÉS, 2008: 937, s.v. *qūbā'*; THE UNIFIED MEDICAL DICTIONARY, 1983: 68, s.v. *qūbā'*; DOZY, 1981: II, 424, s.v. *qūbā'*; KAZIMIRSKI, n. d.: II, 830, s.v. *qūbā'*; CORRIENTE, 1977: 646, s.v. *qūbā'*; IBN AL-JAṬĪB, 1972: 67, s.v. *qūbā'*). For his part, DIOSCÓRIDES, 2002: 105, says that this “foam that oozes from green wood when it burns [...] cures [...] eczema” (own translation). Likewise, DIOSCÓRIDES, 2002: 106, says that the gum resin of the wild olive tree “heals eczema” (own translation).

¹¹ It should be noted that, unlike the rest of the sources, Abū l-Jayr points out here—and when referring to other treatments—that gum resin of a red to purplish color like hyacinth (mineral) that forms large drops and does not sting the tongue should be used, without specifying whether it is from the olive tree or the wild olive tree.

Table 1. *Results. (continued)*

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
Scalp torn off, conglutinates the	Leaves of wild olive tree	Crushed and mixed with honey, applied as a poultice	IB: I, 483; IW: I, 107; T: 205; GF: 156a; ID: I, 138	D
Scabs, tear off the	Leaves of wild olive tree	Crushed and mixed with honey, applied as a poultice	IB: I, 483; IW: I, 107; GF: 156a; ID: I, 138	D (IB/IW)
Emollient (softens, moisturizes the skin and protects it from cold)	Fruit	Sweet oil smeared	IZ (transl.): 134GF: 157a	D
	Ripe fruit	Aged oil		
Ointment component	Fruit	Olive mill wastewater boiled in a copper pot until it acquires the texture of honey or burns, mixed with honey, or wine devoid of any additives, or mulsum wine, or vinegar (this preparation is more effective when aged)	IB: I, 487; T: 212; GF: 158b	D
Smallpox marks, removes	Unripe fruit	Crushed and applied as a poultice	ID: I, 137	
DENTISTRY				
Unstable teeth and gums, strengthens the	Fruit	Omphacine oil in rinses	IBU ¹² / T: 211; IB: I, 485; IW: I, 106; GF: 157a	D (T/IB/IW/ GF)
	Water olive	Brine in which it is preserved, in rinses	IB: I, 484; IW: I, 106; GF: 156b; ID: I, 138	D (IB/IW) / II (GF)
	Leaves of wild olive tree	Chewed	T: 205; GF: 156a	D (T) / ANONYMOUS (GF)
	Leaves	Rinsing	ID: I, 137	
	Fruit of wild olive tree	Oil in rinses	IB: I, 486; IW: I, 108; GF: 157b	D
Bleeding gums	Fruit	Oil smeared on the gums	IB: I, 486	D
	Fruit of wild olive tree	Oil in rinses	IW: I, 108; GF: 157b	D
Gums to which humors flow	Fruit of wild olive tree	Heated oil applied to the gums with a woolen cloth until the gums turn white	IB: I, 486; IW: I, 108; GF: 157b	D
	Leaves	Boiled, in rinses	ID: I, 137	

¹² This quote from Ibn Buklārīš is collected in AL-ARBŪLĪ, 2000: 78, no. 103.

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
Inflamed gums	Leaves	Chewed	IH: 95	
Caries	Leaves	Boiled and kept in the mouth	IB: I, 484; GF 156a	IS (IB) / TB (GF)
	Leaves	Boiled with syrup and kept in the mouth	IH: 95	
Decayed teeth, extraction of	Leaves	Boiled with sour grape juice until it acquires the consistency of honey, and smeared on the decayed teeth, it pulls them out	IB: I, 484; GF 156a	TY (IB) / ANONYMOUS (GF) D
	Fruit	Olive mill wastewater boiled with sour grapes until it acquires the consistency of honey, and smeared on the decayed teeth, pulls them out	IB: I, 487; IW: I, 107; T: 212; GF: 158b	
Canker sores ¹³ and oral ulcers	Leaves of wild olive tree	Chewed	T: 205; IW: I, 107; GF: 156a; ID: I, 138; GF: 156a; ID: I, 138.	D
	Leaves of wild olive tree	Juice or decoction	ID: I, 138	
Healing	Leaves	Chewed	IH: 95	
Dental pain (whether caused by caries or not)	Fruit	Olive mill wastewater boiled in a copper pot, until it acquires the texture of honey or it burns, mixed with honey, or wine devoid of any additives, or mulsum wine, or vinegar, and applied as an ointment on the teeth (this preparation is more effective when aged)	IB: I, 487; T: 212; IW: I, 107; GF: 158b	D D (T/GF) / P (IW)
	Gum resin of wild olive tree or olive tree	Applied in caries	T: 205; IW: I, 109; GF: 156b; AJ: II, 510	
OPHTHALMOLOGY				

(continued)

¹³ The term *al-qulāc* found in al-Ṭignarī and al-Gāfiqī, and translated here as ‘canker sores’, also means ‘lip pustule’ and ‘ulcerative stomatitis’. See, for example, CORTÉS, 2008: 927, s.v. *qulāc*; CORRIENTE, 1977: 640, s.v. *qulāc*. However, we opt for the proposed translation attending to the information offered by DIOSCÓRIDES, 2002: 104.

Table 1. *Results. (continued)*

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
Eyesight, sharpens and clarifies the	Fruit Gum resin of wild olive tree or olive tree	Aged oil administered as eye drops, or new oil boiled until it thickens like honey, applied as eye drops Applied as eye drops in the sinus of the eye	IB: I, 485-486; T: 212; IW: I, 106-107; GF: 157b; ID: I, 139 IJT: 64	D (IB/IW/GF) / F ¹⁴ (IB)
Eyesight, weakness and darkening of the	Gum resin of wild olive tree or olive tree Gum resin of wild olive tree or olive tree	Applied as eye drops Ingested with food	T: 205; IW: I, 109; GF: 156b; AJ: II, 510 IJT: 64	D (T/IW/GF) / P (IW)
Ocular ulcers ¹⁵ , cleans the	Gum resin of wild olive tree or olive tree	Applied as eye drops	T: 205; AJ: II, 510	D
Ocular ulcers, cuts off the flow of chronic moisture to the	Leaves of wild olive tree	Juice elaborated in the form of pills applied to the eye, or the decoction of the leaves	IW: I, 107-108; GF: 156a; ID: I, 138	D
Ulcer called <i>qlqtāyā</i> ¹⁶ , useful for the	Leaves of wild olive tree	Juice elaborated in the form of pills applied to the eye, or the decoction of the leaves	IW: I, 107-108; GF: 156a	D
Leukoma, cleans its dirt and makes it disappear	Gum resin of wild olive tree or olive tree Fruit	Applied as eye drops Blanched oil boiled in water over low heat and applied regularly as eye drops	IW: I, 108; GF 156b IB: I, 486; GF 158a	D F
Staphyloma	Leaves of wild olive tree	Juice elaborated in the form of pills, or the decoction of the leaves	T: 206; IW: I, 107; GF: 156a	D

¹⁴ We understand, following NAVARRO, 1996: 232, that it is *al-Filāḥa al-nabaṭiyya* [Nabataean agriculture].

¹⁵ In al-Tignarī we find the term *al-ḥiṣāb al-qawwī*, while Abū l-Jayr mentions its plural (*ḥuṣūb*) meaning 'membrane'. However, we interpret from the context to mean 'eye ulcers'. On the other hand, it should be noted that *al-ḥiṣāb al-qawwī* could be a corruption—in the manuscript material used for the edition—of the term *al-ḥiṣāb al-qarnī*, meaning 'cornea', a meaning that we nevertheless only find collected in CORTÉS, 2008: 212, s.v. ḥiṣāb.

¹⁶ In reading this word—which we find in al-Gāfiqī as *qlqtānā*—we follow the translator of IBN WĀFID, 1995: I, 107, n. 5.16, but like her we ignore what ailment it designates.

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
It cuts off the flow of chronic moisture flowing from the eye	Leaves of wild olive tree	Juice in tablet form	T: 206	D
Substitute for zinc oxide in ophthalmological treatments	Leaves of wild olive tree + flowers of wild olive tree Fruit of olive tree or leaves of wild olive tree	Burned ¹⁷ Placed in an earthenware container inside a bread oven for one night, they are taken out already burned and cooled, and applied as eye drops	IB: I, 483; T: 204; IW: I, 108; GF: 156a; ID: I, 138-139; IW: I, 108; GF: 156a; ID: I, 138-139. ID: I, 137	D
Pannus, makes it disappear	Fruit of wild olive tree	Olive oil mixed with a bit of aged olive oil	IB: I, 486; GF: 158a	F
Eliminates the thick, cold and dry eyelid humors	Fruit of wild olive tree	Olive oil mixed with a bit of aged olive oil	IB: I, 486; GF: 158a	F
Ailments derived from the excess of humors, cures all the	Fruit	Blanched oil boiled in water over low heat and left to age for at least one year, applied regularly as eye drops	IB: I, 486; GF: 158a	F
Cataract ¹⁸ , alternative remedy to cataract surgery	Fruit	Blanched oil boiled in water over low heat and left to age for at least one year, applied regularly as eye drops	IB: I, 486; GF: 158a	F
Component of eye drops and ophthalmic drugs	Leaves of wild olive tree Fruit	Juice elaborated in the form of pills, or the decoction of the leaves Olive mill wastewater boiled in a copper pot until it acquires the texture of honey or burns, mixed with honey, or wine devoid of any additives, or mulsum wine, or vinegar (this preparation is more effective when aged)	T: 206; IW: I, 107-108; GF: 156a IB: I, 487; T: 212; IW: I, 107; GF: 158b	D D

(continued)

¹⁷ The sources describe in detail, although with some differences, the process of elaboration of this preparation, which they copy from DIOSCÓRIDES, 2002: 105.

¹⁸ We follow here Leclerc (IBN AL-BAYTĀR, 1987: II, 229), who translates in this way the expression *al-cayn al-nāzil fi-hā al-mā'* (lit. 'the eye in which water flows') that we find in the Arabic original.

Table 1. *Results. (continued)*

THERAPEUTIC USES	PLANT PARTS USED ⁵	PREPARATIONS AND FORMS OF ADMINISTRATION	ANDALUSI SOURCES	PRE-ISLAMIC / EASTERN ARABIC SOURCES
Eyelids, beneficial for itching and inflammation of the	Leaves of wild olive tree	Juice elaborated in the form of pills, or the decoction of the leaves	IB: I, 483; IW: I, 107-108; GF 156a	D
Children's strabismus	Leaves	Juice administered nasally	ID: I, 137	

4. DISCUSSION

4.1. 'Temperament' of *Olea europaea* L.

The description of the therapeutic potential of *Olea europaea* L. in the Andalusí sources is based on the principles of Galenic-Islamic medicine. According to these principles, the sources qualify it in general terms as an astringent and detail its different degrees of cold/warmth and humidity/dryness depending on whether they refer to one part or another of the plant, or to the different types of olives and oils.

4.2. Frequency of olive tree and wild olive tree use

As shown in Figure 1, in general, olive tree is used in more treatments (41) than wild olive

tree (31). This is the case in dermatology (olive tree: 19; wild olive tree: 12) and dentistry (olive tree: 12; wild olive tree: 7), but not in ophthalmology, where wild olive tree is used more (12) than olive tree (10).

4.3. Plant parts used

As displayed in Figure 2, in general terms, the fruit is the most used (olive tree: 23; wild olive tree: 9), followed by the leaves (wild olive tree: 17; olive tree: 9), the gum resin (wild olive tree: 6; olive tree: 4), the green wood of the olive tree (5), and the pit of the olive tree fruit (1). More specifically, in dermatology the most commonly used part is the fruit of the olive tree (14), followed by the leaves of the wild olive tree (9) and the green wood of the olive tree (5). In dentistry, the leaves (olive tree: 7; wild

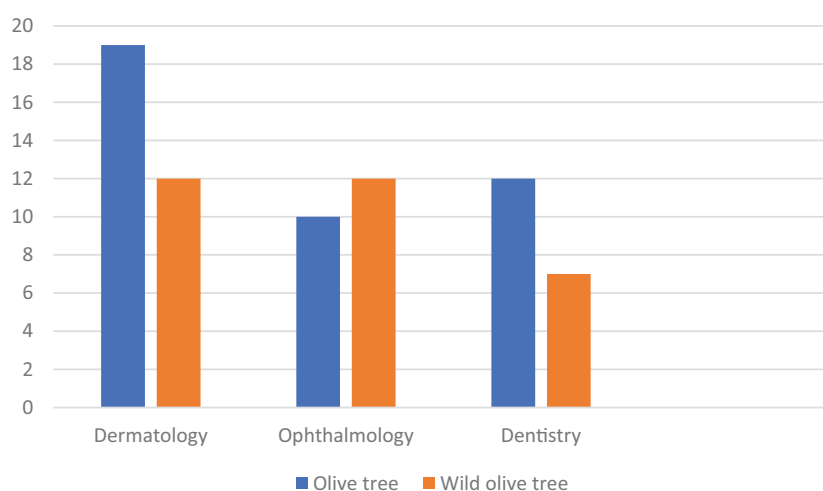


Figure 1. *Frequency of olive and wild olive tree use. Source: own elaboration.*



Figure 2. Frequency of use of plant parts in the three specialties, being olive tree (O) and wild olive tree (WO). Source: own elaboration.

olive tree: 3), and the fruit (olive tree: 4; wild olive tree: 3) were used. In ophthalmology, the most used parts are the leaves (wild olive tree: 8; olive tree: 2), the fruit (olive tree: 5; wild olive tree: 2) and the gum resin (olive tree: 3; wild olive tree: 2).

4.4. Preparation and administration methods

Dermatological treatments are prescribed topically in the form of ointments (oil, moisture exuded by burning green wood, olive mill wastewater) and plasters (leaves, fruit). In dentistry it is prescribed mouthwashes (oil, olive brine, decoction of leaves), chewed leaves, and ointments on gums and decayed teeth (oil, decoction of leaves with grape sour, olive mill wastewater boiled with grape sour). In ophthalmology it was administered as eye drops (aged oil, new boiled oil, fruit of the olive tree, wild olive gum resin¹⁹, juice of leaves of wild olive tree, burnt fruit of the olive tree, leaves of wild olive tree, boiled olive mill wastewater).

4.5. Dermatological treatments

The great therapeutic potential of *Olea europaea* L. for the treatment of various dermatological conditions is the subject of numerous investigations (FILARDO *et alii*, 2024: 7, 10-11; PATITUCCI *et alii*, 2024; DE OLIVEIRA *et alii*, 2024: 403, 412; JANUSZEWSKI *et alii*, 2024: 1, 11; NUNES *et alii*, 2022; CARRARA *et alii*, 2021; VENDITTI *et alii*, 2013; CANO, MARTÍNEZ, 2009a: 219; CANO, MARTÍNEZ, 2009b: 302; BATTINELLI *et alii*, 2006). This potential is due to the antimicrobial, antioxidant, anti-inflammatory and emollient activity of polyphenols and terpene derivatives present in olive oil. The repair capacity of oleic acid and the antioxidants present in it endow it with a unique power to treat skin conditions (SÁNCHEZ-RODRÍGUEZ, MESA, 2018: 90-91). On the other hand, the ethanolic, methanolic and hydroalcoholic extracts present in the leaves of *Olea europaea* L. have antimicrobial effects, so they also have great potential for the treatment of dermatological diseases caused by different infectious agents, as is the case of *Staphylococcus aureus*

¹⁹ Following in part the information found in DIOSCÓRIDES, 2002: 106, the Andalusí naturalists specify that the gum resin of the wild olive tree that should be used in therapeutic treatments is the one that exudes in the form of small drops, stings the tongue and is of a color similar to that of the red hyacinth (mineral). On the contrary, they point out that the one that exudes in the form of large drops and does not sting the tongue is not useful for such treatments. On the other hand —to the best of our knowledge— a healthy olive tree or wild olive tree does not exude any type of resinous substance. However, those that suffer the attack of external agents can suffer from gummosis, that is to say, produce gum resin to protect themselves from these agents. This is the case of olive trees attacked by larvae of *Zeuzera pyrina* L. (DURÁN *et alii*, 2004: 455) or larvae of *Euzophera semifuneralis* (GUÍA DE RECONOCIMIENTO DE PLAGAS, 2005: 11).

(CRUGEIRA *et alii*, 2023; SELIM *et alii*, 2022: 17). This therapeutic potential of *Olea europaea* L. for dermatological treatments was already well known to Andalusí naturalists, who mention the emollient properties of olive oil and indicate in general terms that it softens, moisturizes and protects the skin from cold. However, these naturalists did not make a significant original contribution to the knowledge they inherited from the pre-Islamic period, since, out of a total of eighteen uses recorded by them, seventeen had already been mentioned previously by Dioscorides (1st c.), whom they quote recurrently in this respect.

One of the therapeutic uses of *Olea europaea* L. recorded in Andalusí texts are trichological treatments. Among them is the use of wild olive oil smeared as a hair tonic, which is said to strengthen weak hair, preventing hair loss and thickening it. In the 12th century Ibn Zuhri formulated a new tonic that was made by boiling sorrel (*Melia azedarach* L.) in water until it cracked a little. This decoction was then filtered and a similar amount of sweet olive oil was added and boiled again until the water was consumed. The potential effectiveness of these trichological treatments is validated nowadays by several research studies (AL-OWAMRI *et alii*, 2023; SHETH, DANDE, 2021: 8-9; KUMAR *et alii*, 2016: 40; HASHMI *et alii*, 2015: 10). It has been shown that emulsions containing olive oil — among other vegetable oils— have a positive effect on hair growth (KALONDA *et alii*, 2021). Likewise, there is a patented product to stimulate hair growth containing among other components hydroalcoholic extract of leaves of olive tree with 10 % oleuropein (LACHEVA, 2019: 13). Andalusí naturalists also recommend using *Olea europaea* L. for cosmetic purposes to delay graying of the hair and blacken it, for which they prescribe daily smearing it with wild olive oil (Ibn al-Bayṭār, Ibn Wāfid, al-Gāfiqī, al-Idrīsī).

Another interesting aspect is the use of *Olea europaea* L. as an anti-dandruff agent. Various ways of treating this condition are described in Andalusí texts (Ibn al-Bayṭār, Ibn Wāfid, al-Tignarī, al-Gāfiqī, al-Idrīsī). One of them

consists of smearing the moisture oozing from the green wood when it burns (Ibn al-Bayṭār; Ibn Wāfid; al-Tignarī; al-Gāfiqī; al-Idrīsī); others prescribed a poultice of crushed olives, or smeared olive oil (Ibn al-Bayṭār; Ibn Wāfid; al-Gāfiqī). The potential effectiveness of these treatments is validated at present by some scientific publications that point out that olive oil is useful to temporarily remove dandruff flakes from the scalp, penetrating the scalp and moisturizing dry areas that may flake (SHETH, DANDE, 2021: 8-9; ZONDI, 2017).

Andalusí naturalists also prescribed the use of *Olea europaea* L. as a scabicide to treat scabies. In this regard they mention three different treatments consisting of smearing the affected area with the moisture that oozes from the green wood when it burns, applying wild olive oil, or gum resin of wild olive tree or olive tree. At present, there do not seem to be scientific studies that validate the potential effectiveness of this treatment applied to people, but there are studies that validate its effectiveness in veterinary treatments (MEJIA, 2015).

Another of the dermatological uses of *Olea europaea* L. most frequently described in Andalusí sources is its use as a vulnerary and healing agent for wounds, fistulas and burns, to remove scabs from wounds and pustules, to eliminate pockmarks and to conglutinate the scalp. The wide variety of medicinal preparations described in this respect gives an idea of the high degree of knowledge that Galenic-Islamic medicine and pharmacology reached in al-Andalus. However, it should not be forgotten that the Andalusí naturalists are absolutely indebted to Dioscorides on this point as well. For the elaboration of the plasters, they used boiled olive mill wastewater, gum resin of wild olive tree or olive tree, crushed leaves of wild olive tree and honey, water olives or green olives preserved in salt and water or in vinegar and crushed, crushed unripe olives, burned ripe black olives and the humidity that oozes the humid wood when it is burned. There is now ample scientific evidence to demonstrate that *Olea*

europaea L. —and in particular the extract of its leaves — has a high potential as a vulnerary and healing agent for wounds and burns (DE OLIVEIRA *et alii*, 2024: 403; AL-OWAMRI *et alii*, 2023; RIVAS-GARCIA *et alii*, 2023: 198; ESMAEILI *et alii*, 2023: 19-20, 22; TORRECILLAS-BAENA *et alii*, 2023; AL-WARHI *et alii*, 2022; ELNAHAS *et alii*, 2021; POLJŠAK, KREFT, KOČEVAR, 2020: 257-258; WANITPHAKDEED-ECHA *et alii*, 2020: 1662; LACHEVA, 2019: 12; MEJIA, 2015: 40-41; KOCA *et alii*, 2010; CANO *et alii*, 2002).

The Andalusí naturalists also prescribed the use of *Olea europaea* L. for the treatment of nail ailments. To make the ‘white spots on the nails’ disappear²⁰ it was recommended to use the inner part of the pits of the olive mixed with fat and flour. Another treatment —which may have originated in al-Idrīsī (12th c.), the only author to mention it— prescribes using the moisture oozing from green wood when burned, mixed with olives. In relation to periungual ailments, a poultice of crushed wild olive leaves is mentioned in the texts to treat whitlow. The potential effectiveness of these nail and periungual treatments is not scientifically validated to date, although we have some ethnobotanical evidence of these uses in Italy (MAZZEI *et alii*, 2020: 6) and Turkey (AKBULUT, YILMAZ, 2022: 1899).

Another of the dermatological conditions treated with *Olea europaea* L. in Andalusí Galenic-Islamic medicine was erysipelas, for which a hot poultice based on crushed leaves of wild olive tree was prescribed. No scientific studies seem to have been published so far to validate the potential effectiveness of the treatment of this disease with *Olea europaea* L., although we have some ethnobotanical evidence of it in Italy (MAZZEI *et alii*, 2020: 6) and in Spain (BRITO DA SILVA *et alii*, 2018: 202).

Finally, it is worth mentioning the treatment of eczema by means of two ointments: the first

based on the humidity that oozes from the green wood when it burns (Ibn al-Bayṭār; Ibn Wāfid; al-Tignarī; al-Gāfiqī); the second, based on gum resin of wild olive tree or olive tree dissolved in vinegar or not (al-Tignarī; Ibn Wāfid; al-Gāfiqī; Abū l-Jayr). The potential effectiveness of this treatment does not seem to have been scientifically validated so far. However, it should not be forgotten what has already been said about the antimicrobial properties of *Olea europaea* L., whose effectiveness has been validated in the treatment of dermatological conditions that have their origin in infectious processes, such as can sometimes be the case of the eczema.

4.6. Dental treatments

The therapeutic potential of *Olea europaea* L. in the field of dentistry was already known to Andalusí naturalists at least since the 9th century, when it is first mentioned by Ibn Ḥabīb. However, as it was the case in the field of dermatology, these naturalists also did not make a noteworthy original contribution to the knowledge they inherited from Dioscorides in that respect, since, out of a total of nine dental uses of *Olea europaea* L. recorded by them, eight had already been mentioned previously by the Greek naturalist, whom they cite recurrently.

One of the dental treatments of *Olea europaea* L. described in Andalusí texts is the treatment of caries. For this purpose, rinses are prescribed with a decoction of leaves of olive tree, a mouthwash that was also elaborated by boiling these leaves in syrup, although it is not specified which syrup it is. Nowadays, the potential effectiveness of this treatment is scientifically validated. Olive oil is rich in oleic acid and other phenolic compounds, thanks to which it is useful in combating *Streptococcus mutans*, bacterium normally found in the human oral cavity as part of dental plaque or biofilm, which is

²⁰ It could be nails affected by leukonychia. For his part, DIOSCÓRIDES, 2002: 105, says that the preparation mentioned here “makes the mangy nails fall down” (own translation).

associated with the onset and development of dental caries and is the most influential agent in the development of this disease. In addition, the antimicrobial properties (antibacterial, antifungal and antiviral) of ethanolic, methanolic and hydroalcoholic extracts of the leaves of the olive tree (CRUGEIRA *et alii*, 2023; SELIM *et alii*, 2022: 17) also exhibit activity against *Streptococcus mutans*, and can be used as a natural preservative to prevent dental caries (GOLESTANNEJAD *et alii*, 2020; NARDI *et alii*, 2020; MATH, KATTIMANI, GAWALI, 2020; SINGH *et alii*, 2016) and for the manufacture of toothpastes (RAJHI *et alii*, 2021). On the other hand, Andalusí naturalists mention the use of *Olea europaea* L. for the extraction of decayed teeth, for which they prescribe smearing them with leaves of the olive tree, or olive mill wastewater, that were boiled with sour grape juice until this decoction acquired the consistency of honey. To date, the effectiveness of this treatment has not been scientifically validated.

Andalusí sources also speak of how to use *Olea europaea* L. to treat various periodontal diseases and symptoms and prescribe various treatments to strengthen gums and unstable teeth (Ibn Buklāriš; al-Tignarī; Ibn al-Bayṭār; Ibn Wāfid; al-Gāfiqī; al-Idrīsī). The most frequent are rinses with omphacine oil, or with the brine in which the so-called water olives were preserved, or with the oil of wild olive tree. For the same purpose, chewing leaves of wild olive tree or rinsing with a decoction of these leaves was also prescribed. Likewise, bleeding gums were treated by smearing them with olive oil or rinsing them with oil from the wild olive tree. For gums affected by 'influx of humors' they prescribed oil of wild olive tree heated and applied with a woolen cloth until the gums turned white, or rinsing with a decoction of leaves of olive tree. On the other hand, Ibn Ḥabīb recommends chewing the leaves of the olive tree to treat inflamed gums, a treatment that only he mentions, which leads one to believe that he would have been its precursor. *Olea europaea* L. was also used as a healing remedy to cure canker sores and oral ulcers, for which chewing the leaves

of olive tree or wild olive tree was prescribed. The effectiveness of *Olea europaea* L. in the treatment of periodontal diseases is widely contrasted from the scientific point of view (DE OLIVEIRA *et alii*, 2024: 413; ÁLVAREZ-HERNÁNDEZ *et alii*, 2024; RIVAS-GARCIA *et alii*, 2023: 206; HERAWATI, PERTIWI, 2021; IWASAKI *et alii*, 2021; SHAH *et alii*, 2021; ZHANG *et alii*, 2021; CARROL *et alii*, 2020; HERAWATI, ANGGRAENI, DAMAYANTI, 2020; MATH, KATTIMANI, GAWALI, 2020; SHOUKHEBA, ALI, 2014; PATEL *et alii*, 2012).

Another dental use of *Olea europaea* L. described in Andalusí sources is the treatment of dental pain caused by caries or other causes. For this purpose it was prescribed to spread on the painful teeth olive mill wastewater boiled in a copper pot until it acquired the texture of honey or burned, mixed with honey, or with wine devoid of any additives, or with mulsum wine, or with vinegar, preparations that were considered more effective if they were left to age (Ibn al-Bayṭār; Ibn Wāfid; al-Gāfiqī; al-Tignarī; Abū l-Jayr). Currently, the analgesic properties of *Olea europaea* L. have been scientifically proven and we know that olive oil has analgesic, antipyretic and anti-inflammatory activity, acting in synergy with ibuprofen, whose properties it enhances (SÁNCHEZ-RODRÍGUEZ, MESA, 2018; MEJIA, 2015: 41). Also, the extract of the leaf of olive tree has analgesic properties (ESMAEILI-MAHANI *et alii*, 2010).

4.7. Ophthalmological treatments

As in the fields of dermatology and dentistry, the Andalusí naturalists found in Dioscorides their main source of knowledge about the different possibilities of therapeutic application of *Olea europaea* L. in the field of ophthalmology, since twelve of the sixteen uses recorded in the Andalusí sources had already been previously cited by him. These sources indicate in general terms that *Olea europaea* L. was an essential component of eye drops and other ophthalmic drugs, and mention two *ad hoc* preparations: juice of leaves of wild olive tree

elaborated in the form of pills²¹ or the decoction of these leaves (al-Tignarī; Ibn Wāfid; al-Gāfiqī); olive mill wastewater boiled in a copper vessel until it acquired the texture of honey or burned, mixed with honey, or with wine devoid of any additives, or with mulsum wine, or with vinegar (Ibn al-Bayṭār; al-Tignarī; Ibn Wāfid; al-Gāfiqī). Likewise, they indicate that *Olea europaea* L. strengthens, sharpens and clears the eyesight, for which they prescribed several eye drops based on aged olive oil, or new olive oil boiled until it thickened like honey (Ibn al-Bayṭār; al-Tignarī; Ibn Wāfid; al-Gāfiqī; al-Idrīsī), or gum resin of wild olive tree or olive tree applied in the sinuses of the eyes (al-Tignarī; Ibn Wāfid; al-Gāfiqī; Abū l-Jayr), or this same gum resin ingested with food (Ibn al-Jaṭīb).

The therapeutic potential of *Olea europaea* L. for the treatment of some ocular diseases has been the subject of several scientific investigations that attribute it to its anti-inflammatory and antioxidant properties (SOLTANI *et alii*, 2022; KATSINAS, RODRÍGUEZ-ROJO, ENRÍQUEZ-DE-SALAMANCA, 2021; SANTANA-GARRIDO *et alii*, 2020: 2). We know that the hydroxytyrosol present in the fruit of *Olea europaea* L. protects the retina and ocular health from macular degeneration and glaucoma caused by oxidative stress (SANTANA-GARRIDO *et alii*, 2021; SÁNCHEZ-RODRÍGUEZ, MESA, 2018: 91). Likewise, it is very interesting to note that the potential effectiveness of ophthalmological treatments with olive mill wastewater recorded in Andalusí texts is scientifically validated nowadays. The polyphenols present in this product resulting from the olive oil production process possess antioxidant and anti-inflammatory properties, which can serve as a basis for developing new drugs for the treatment of inflammatory diseases of the ocular surface (DI MAURO *et alii*, 2019). On the other hand, this and other medicinal uses of olive mill wastewater by Andalusí naturalists

present them as precursors of the integral use of *Olea europaea* L., which is today a subject of great importance—in the framework of what has been called recently circular economy—for researchers interested in exploring the therapeutic potential of this plant species (MALLAMACI *et alii*, 2021).

Among the different ophthalmological uses of *Olea europaea* L. mentioned by the Andalusí naturalists the treatment of cataracts stands out. They knew of the usefulness of *Olea europaea* L. to treat this disease at least since the 12th century, when al-Gāfiqī speaks of it for the first time in al-Andalus. The latter prescribes assiduously applying an eye drop based on blanched olive oil boiled in water over low heat and left to age for at least a year. It should be noted that in this case al-Gāfiqī's source is *al-Filāḥa al-nabaṭiyya* [*Nabataean agriculture*] (10th c.), a work that collects many magical beliefs that were in circulation within the Chaldean agricultural community of Babylonia between the end of the Hellenistic era and the beginning of the Islamic era (FAHD, 1986; FAHD, 1977: 284, 369). Given the nature of this work, it could be thought *a priori* that the information it offers us is not relevant to the subject at hand. However, today there is scientific evidence on the usefulness of *Olea europaea* L. for the treatment of cataracts, an ailment for which there is still no pharmacological remedy. It has been demonstrated that the active components of olive leaf extracts serve to treat cataracts at the molecular level and have a preventive action (BADRIA, ELGAZAR, 2021: 454).

The use of *Olea europaea* L. to treat leukoma has also been recorded in the sources (Ibn al-Bayṭār; al-Gāfiqī). The earliest mention of this treatment in al-Andalus is due to al-Gāfiqī himself, who also reproduces on this point the information he found in the *Nabataean Agriculture*, where it is prescribed to assiduously apply

²¹ The Andalusí naturalists copy this way of elaborating the juice from Dioscorides, 2002: 104, who describes it as follows: "To extract the juice, it is necessary to crush the leaves and, pouring wine or water on them, squeeze them; and, drying it in the sun, give it the form of pills" (own translation). Although in the case of this and other treatments it is *a priori* much easier to think of the liquid juice than of these solid pills, nevertheless, the information that we find in Dioscorides leaves no room for doubt, which leaves open the question of how they were administered to the patient. Perhaps these pills were elaborated to—as some Arab naturalists indicate—facilitate the storage and conservation of the juice, and it is possible that before being administered they were diluted in water.

an eye drop based on blanched olive oil boiled in water over low heat. Andalusí texts also mention the treatment of staphyloma, for which the juice of the leaves of the wild olive tree prepared in the form of pills, or a decoction of these leaves, was prescribed (al-Tignarī; Ibn Wāfid; al-Gāfiqī). In addition, al-Gāfiqī prescribes —again citing the *Nabataean Agriculture*— wild olive oil mixed with a little aged olive oil to treat pannus²². Apparently, no scientific research has been published so far about the potential effectiveness of treating leukoma, staphyloma, and pannus with *Olea europaea* L. However, one should not forget what has already been said about the anti-inflammatory and antioxidant properties of the extract of its leaf for the treatment of inflammatory diseases of the ocular surface. This, together with some ethnobotanical evidence on the use of *Olea europaea* L. in traditional medicine (HASHMI *et alii*, 2015: 10) and in ethnoveterinary practices to treat ocular infections (SINMEZ, ASLIM, YAŞAR, 2018: 80), allows glimpsing new perspectives of pharmacological research on its possible therapeutic potential for the treatment of those three eye diseases mentioned above.

Andalusí sources also mention the use of *Olea europaea* L. for the treatment of eye ulcers. To clean them an eye drop based on gum resin of wild olive tree or olive tree was prescribed (al-Tignarī; Abū l-Jayr); to cut the ‘flow of chronic moisture that flows’ to those ulcers it was prescribed to apply in the affected eye juice of leaves of wild olive tree elaborated in the form of pills or a decoction based on the same leaves (al-Tignarī). Although there is no scientific validation of the potential effectiveness of *Olea europaea* L. for the treatment of eye ulcers, it should be remembered its properties and use as a vulnerary and healing agent and for the treatment of infections of different etiology.

Finally, mention should be made of a remedy —recorded only by al-Idrīsī— to treat children’s strabismus with olive leaf juice administered nasally. The potential effectiveness of this treatment is not scientifically validated at present.

4.8. *Olea europaea* L. in the traditional medicine of al-Andalus?

The practice of Galenic-Islamic medicine co-existed in al-Andalus with the practice of traditional folk medicine. Although both forms of medicine constituted well differentiated spheres from a conceptual and social point of view, they were by no means watertight compartments, since it is plausible that traditional medicine was somehow permeable to the influence of galenic medicine²³, while the latter incorporated some magical, credential, or other elements of the former (IBN ḤABĪB, 1992: 24-25). In this sense it is worth remembering that Dioscorides already declares to have written his *De materia medica* on the basis of “experience [...] rigorously investigating other [plants] from the consistent information of all *and from the questions to the local inhabitants for each of them*”²⁴ (DIOSCÓRIDES, 2002: XV). It follows that the Greek naturalist integrated into his rational and scientific knowledge about plants elements of traditional folk medicine that circulated in the many areas of the Mediterranean that he traveled during his lifetime. These ethnobotanical practices and knowledge recorded among other naturalists by Dioscorides were received in al-Andalus in two ways: in the field of Galenic-Islamic medicine, mainly through the Arabic translation of *De materia medica* and other works; in the field of traditional medicine, as a result of the Islamic conquest of North Africa, the Iberian Peninsula and other areas of the Mediterranean from the end of the

²² Arabic: *riḥ al-sabal*, which we translate here as ‘pannus’ following THE UNIFIED MEDICAL DICTIONARY, 1983: 45, s.v. *sabal*. For their part, KAZIMIRSKI, n. d.: I, 1047, s.v. *sabal*, and LANE, 1980: IV, 1302, s.v. *riḥ al-sabal*, say that this term designates ‘an eye disease’, but do not specifically mention pannus.

²³ EL-GHARBAOUI *et alii*, 2017: 222, mention a possible example of this influence of Galenic-Islamic medicine on traditional medicine. According to them, 43 % of the ethnobotanical uses of Lamiaceae recorded in eastern Morocco could have been derived directly from Ibn al-Bayṭār’s *Kitāb al-Ŷāmic*.

²⁴ The translation and the italics are ours.

7th century, which allowed the new conquerors to learn first-hand about those practices and knowledge that would have survived in that region from the time of Dioscorides until then.

As regards the specific case of *Olea europaea* L. —despite the lack of textual evidence and pending future contributions from archaeology and other related disciplines in this regard— there are some facts that allow us to think that in general terms in al-Andalus the therapeutic treatments recorded in the galenic medical-pharmacological texts had a correlate in the field of traditional folk medicine. This question is relevant to obtain an accurate picture of the true dimension of the therapeutic uses of *Olea europaea* L. in the context of Andalusí societies, beyond the strict framework of galenic treatments, whose degree of diffusion and real application at the social level we are not in a position to evaluate due to the lack of information on the subject.

We know that *Olea europaea* L. had a very prominent presence in the Andalusí agricultural landscape, of which it became one of its protagonists (GARCÍA-SÁNCHEZ, CARABAZA BRAVO, HERNÁNDEZ-BERMEJO, 2021: 353). In this sense, it should not be forgotten that the pre-Islamic populations of the Iberian Peninsula were already familiar with the wild olive tree and the olive tree, whose cultivation was extended by the Romans to Galicia, northern Portugal, areas of Castilla y León, La Rioja and Navarra (GARCÍA-SÁNCHEZ, CARABAZA BRAVO, HERNÁNDEZ-BERMEJO, 2021: 342). Moreover, the regular presence of *Olea europaea* L. in some of the agricultural areas of al-Andalus was accompanied by an abundant and rich geponic literature on this species, which could also have contributed —in some way— to making its properties and medicinal uses better known among the Andalusí populations. Likewise, it is well known the wide diffusion and the great importance that olives and olive oil had in the diet of the Andalusí populations (GARCÍA, 1996), which leads us to think that in general terms it was an affordable product from the economic point of view, at least for a significant part of the people, especially

in the olive-growing areas. In addition, the inhabitants of these areas would have had easy access —it can be assumed that with little or no economic cost— to the leaves, the olive mill wastewater, the gum resin and the humidity oozed by the green wood when burning, which were used as a base for a great number of treatments. From all these factors it could be concluded that the populations living in the olive-growing areas of al-Andalus were quite, or very, familiar with *Olea europaea* L., with its different products and —it can be inferred— with its bromatological and medicinal properties to a certain extent.

On the other hand, we have ethnobotanical evidence of various uses of *Olea europaea* L. in the field of traditional medicine in the Mediterranean region. The comparison of these uses with those recorded in the Andalusí sources shows the existence of very significant coincidences between them that can hardly be explained as mere coincidences and that, on the contrary, seem to indicate the existence of a close connection between both groups of uses. Unfortunately, we lack data that would allow us to completely understand this connection and its scope. However, it is possible to advance the hypothesis that the uses of *Olea europaea* L. in traditional Mediterranean medicine are —to a greater or lesser extent, in one way or another— a reflection, an indication, perhaps a witness that the uses recorded in the Andalusí sources —and hypothetically also present in the traditional medicine of al-Andalus— survived throughout the centuries in the Mediterranean region.

To illustrate this hypothesis we will focus on the field of dermatology, where these coincidences are particularly clear and numerous, since, out of a total of eighteen uses recorded in the Andalusí sources, sixteen have a correlate in the traditional medicine of the Mediterranean and other areas of the Islamic world. The use of olive oil to treat erysipelas is documented in Italian traditional medicine (MAZZEI *et alii*, 2020: 6) and in the western area of the province of Granada (Spain) (BRITO DA SILVA *et alii*, 2018: 202). Regarding trichological treatments, in the

West Bank olive oil is currently among the most widely used traditional household remedies to repair damaged hair and to treat hair loss and baldness (ZAID *et alii*, 2017: 4, 6, 8). The latter utility is also documented in Persian traditional medicine (PARVIZI *et alii*, 2021: 177), in Morocco (AJJOUN *et alii*, 2022: 22), in Alexandria (Egypt) (ELANSARY *et alii*, 2015: 119) and in the Datça peninsula (Muğla, Turkey) (AKBULUT, YILMAZ, 2022: 1899). In Morocco, olive oil is used alone or with other oils as a brilliantine to give vigor, softness and shine to the hair, as well as an excipient to make ointments, liniments and hair oils (BELLAKHDAR, 2020: I, 280). In traditional Moroccan medicine, the leaves and olives are also used as anti-dandruff (AJJOUN *et alii*, 2022: 22). Likewise, the use of *Olea europaea* L. is documented in the Amhara region (Ethiopia) for the treatment of eczema (LULEKAL *et alii*, 2013: 8, 10), and the use of olive oil for the treatment of impetigo in Italian (MAZZEI *et alii*, 2020: 6) and Persian (PARVIZI *et alii*, 2021: 177) traditional medicine. The use of *Olea europaea* L. as a vulnerary and healing remedy is possibly one of the most widespread and frequent uses in the framework of Mediterranean ethnobotanical practices. Olive oil has been traditionally used to treat burns in Spain (BRITO DA SILVA *et alii*, 2018: 202), in Sardinia (LEONTI *et alii*, 2009: 262), in Morocco (AJJOUN *et alii*, 2022: 40) and in traditional Persian medicine (PARVIZI *et alii*, 2021: 177). In Castellón (Spain), an emulsion of leaves of wild olive tree or an ointment made with its flowers was used externally due to its antiseptic and vulnerary virtues to treat wounds (PARDO DE SANTAYANA *et alii*, 2018: 280). This use is also documented in the Datça peninsula (Muğla, Turkey) (AKBULUT, YILMAZ, 2022: 1899). Likewise, in the ethnoveterinary field, there is evidence of its use for the treatment of sunburn in Central Anatolia (SINMEZ, ASLIM, YAŞAR, 2018: 75) and as a vulnerary in the Turkish province of Giresun (GÜLER *et alii*, 2021: 58). On the other hand, the use of *Olea europaea* L. as a scabicide in ethnoveterinary practices in Central Anatolia and Sardinia has been documented (SINMEZ, ASLIM, YAŞAR, 2018: 75, 79). Finally, the treatment of whitlow with olive oil in Italian traditional medicine (MAZZEI *et alii*, 2020: 6) and of nail affections in general in the Datça peninsula

(Muğla, Turkey) should be noted (AKBULUT, YILMAZ, 2022: 1899).

5. CONCLUSION

The results of the present research are relevant to better understand an important aspect of the history of health, hygiene and disease among the populations of al-Andalus, but they are also relevant from the perspective of historical ethnobotany, ethnopharmacology and ethnomedicine (EL-SEEDI *et alii*, 2019; EL-GHARBAOUI *et alii*, 2017; MARTÍNEZ-FRANCÉS *et alii*, 2015; DA SILVA *et alii*, 2014; HEINRICH *et alii*, 2006; GILANI, ATTA-UR-RAHMAN, 2005; HERNÁNDEZ, GARCÍA, 1998; HERNÁNDEZ, LORA-GONZÁLEZ, 1996). The information provided by the Andalusí texts complements the contribution of these disciplines to the knowledge of the history of the therapeutic uses of *Olea europaea* L. in the field of traditional medicine in the Mediterranean region. In turn, the contributions of these disciplines are of great value to scientists interested today in investigating the therapeutic potential of *Olea europaea* L., as these contributions suggest new lines of research on the multiple possibilities of medicinal use of this species with a view to the development of new drugs (BADRIA, ELGAZAR, 2021: 445; KALONDA *et alii*, 2021: 13).

Andalusí naturalists achieved a high degree of knowledge about the therapeutic potential and uses of *Olea europaea* L. in dermatology, dentistry and ophthalmology.

These naturalists anticipated in several centuries an important part of what science knows today about the multiple possibilities of therapeutic application of *Olea europaea* L.

The potential effectiveness of a very significant part of the treatments with *Olea europaea* L. recorded in the Andalusí sources is validated at present by numerous scientific investigations.

It is very plausible that *Olea europaea* L. would have been used in al-Andalus in the field

of Galenic-Islamic medicine and in that of traditional folk medicine at the same time.

The numerous coincidences between the dermatological ethnobotanical uses of *Olea europaea* L. recorded in the context of traditional Mediterranean medicine and those recorded in Andalusí sources allow us to hypothesize that these uses have survived in the Mediterranean region throughout the centuries and up to the present day.

Notwithstanding the above, some dermatological and a significant part of the dental and ophthalmological uses of *Olea europaea* L. recorded in Andalusí sources have no correspondence in traditional Mediterranean medicine. Following EL-GHARBAOUI *et alii* (2017: 222), this could be interpreted as indicative of a loss of knowledge about the use of this plant species.

The effectiveness of a significant percentage of the therapeutic uses recorded in the Andalusí texts has not been validated so far by modern scientific literature. This, together with the loss of knowledge on the medicinal uses of *Olea europaea* L. mentioned above, may inspire new directions in research on other possible therapeutic applications of *Olea europaea* L. not explored so far.

Dioscorides' *De materia medica* is by far the most recurrent and extensively cited work by the Andalusí naturalists when discussing almost all the therapeutic uses they record. References to Galen are very sporadic and brief, with only al-Idrīsī, Ibn al-Bayṭār and al-Gāfiqī mentioning him. The same is true of Paul of Aegina, cited only once by Ibn Wāfid. On the other hand, the Andalusí naturalists also occasionally report the authority of some eastern Arabic sources: Ishāq Ibn ʿImrān and al-Ṭabarī (cited by al-Gāfiqī), Ibn Sīnā (cited by Ibn al-Bayṭār), *al-Filāḥa al-nabaṭiyya* (cited by Ibn al-Bayṭār and al-Gāfiqī).

The Andalusí naturalists do not seem to have made a really significant original contribution to the information they found in their sources. There are very few therapeutic uses mentioned by them that had not been previously mentioned by other pre-Islamic or eastern Arab scholars. They acted mainly as transmitters of the knowledge about the medicinal potential of *Olea europaea* L. that they inherited from the Greek and eastern Arab traditions, in general, and from Dioscorides, in particular.

The only treatments recorded in the sources that could have originated in al-Andalus are: leaves of olive tree chewed for inflamed gums and as a healing remedy (Ibn Ḥabīb); olive gum resin administered as eye drops to clear and sharpen eyesight (Ibn al-Jaṭīb); leaves of olive tree and wild olive tree as a substitute for zinc oxide in ophthalmological treatments; juice of the leaves of olive tree administered nasally for children's strabismus (al-Idrīsī)²⁵.

The use by the Andalusí naturalists of the olive mill wastewater, the leaves, and even the gum resin and the humidity that the green wood exudes when burned, presents these naturalists as precursors *avant la lettre* of the integral use of *Olea europaea* L., within the framework of what has recently been called circular economy.

From a prospective point of view, it is concluded that future research studies similar to the one presented here requires the collaboration of arabists, archaeologists, researchers in the field of ethnobotany and experts in medicine and pharmacology.

ACKNOWLEDGEMENTS

Our most sincere thanks to our dear friend and colleague Dr. Julia María Carabaza Bravo, for her valuable bibliographic guidance on the history of the olive tree in al-Andalus

²⁵ In any case, it goes without saying that the fact that the Andalusí authors do not cite any source in these cases does not necessarily mean that they had not taken the information from one without mentioning it.

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